

BULLETIN OF MISCELLANEOUS INFORMATION No. 9 1930 ROYAL BOTANIC GARDENS, KEW

XLV.—NANDI COFFEE. A. A. BULLOCK.

Through various correspondence which has recently reached Kew attention has been drawn to a paper by Mr. W. J. Dowson,* where *Coffea nandiensis* is stated to be the only native coffee found in Kenya Colony. In view of the possible widespread use of this name in East Africa it is desirable to point out that this is only a manuscript name, synonymous with *C. eugenoides* Spencer Moore which antedates it, and to outline the history of the plant as far as known.

In 1919, Mr. W. J. Dowson, Government Mycologist at Nairobi, sent specimens of native coffee to Kew for determination, and it was decided that these represented a new species. The material, however, was not complete, and it was not possible to describe the plant until further specimens were received. In 1921, complete material was sent from Kenya, and Mr. Dowson suggested in his letter that the name *C. nandiensis*, from the locality in which it grew, would be appropriate. This was agreed to, and the name became current in Kenya. Owing, however, to pressure of work, the specimens were laid aside and the name was not published.

Still further specimens of this coffee were received in 1921, this time from Uganda, and these were determined as *Coffea eugenoides* S. Moore, a species published in 1907 in the Journal of Botany.†

Recently enquiries as to the place of publication of *C. nandiensis* and the name of the author, have necessitated the re-opening of the question and the examination of the correspondence, and after careful comparison of the type specimen of *C. eugenoides* at the British Museum (Natural History), it has been established beyond doubt that *C. nandiensis* and *C. eugenoides* Spencer Moore are conspecific. In addition, it is clear from the original correspondence that the erroneous decision of 1919 was due to *C. eugenoides* Spencer Moore having been overlooked.

In the original publication of *C. eugenoides* only a single specimen was cited. A list of the specimens now existing in the Kew Herbarium is given below.

Coffea eugenoides S. Moore in Journ. Bot. 45 : 43 (1907).—*C. nandiensis* Dowson ex Hutch. ms. in Herb. Kew ; Dowson in Ann. Appl. Biol. 8 : 88, 89 (1921), nomen.

*W. J. Dowson in Ann. Appl. Biol. 8 : 88 (1921), "Problems of Economic Biology in East Africa, 4, Coffee."

†Vol. 45, p. 43 (1907).

UGANDA PROTECTORATE. Forest near Mpanga, Toro, *Bagshawe* 1076 (type in Mus. Brit.); Mukono, *Dummer* 1244; Mulange, *Dummer* 4409; Kangaje Forest, *Maitland* 130A; Ibanda, Ruwenzori, *Maitland* 933; Bumoni, Mt. Elgon, *Snowden* 858. Cultivated specimens:—Government Plantation, Kampala, originally from Nandi, *Snowden* 730; Mukono, *Snowden* 729.

KENYA COLONY. Nandi and Kakumega Forests, *Battiscombe* 659; Nandi and Nyanza Basin Forests, *Moon* 569; Kakumega Forest, *Adams* 1176; Nasai Reserve, *Dowson* 718, 720. Cultivated specimens:—Government Farm, Nairobi (infected with *Hemileia vastatrix*), *Dowson* s.n.

This species is known locally as "Nandi" or "Mukono Coffee," from the district names where it is commonly found. It is, in its native habitat, a shade-loving plant, and is to be found on the banks of most rivers in the interior of Kenya and Uganda in dense shade, at altitudes varying from 4000-6000 ft. above sea level. Here it assumes a very straggling habit, and attains a height of 20 ft. Under cultural conditions, however, it becomes a low, compact shrub, almost conical in shape; the leaves become much smaller, and although the flowers appear to be unchanged, the fruits are smaller. It is unlikely that "Nandi" coffee will prove commercially valuable; apart from the small size of the "parchment," the beverage produced by this species is of inferior quality, and, in addition, the plant is very susceptible to the rust fungus *Hemileia vastatrix* B. & Br.

Improvement in every respect could no doubt be effected by selection, but while *C. robusta* and *C. arabica* can be relied upon to produce good coffee in East Africa, the claims of *C. eugenoides* for expensive experimental culture are slight.

XLVI.—ACACIA TORTILIS AND ACACIA SPIROCARPA.

J. BURTT DAVY.

Acacia tortilis Hayne is one of the gum-yielding trees of N. Africa, ranging across the continent from Timbuktu to the Anglo-Egyptian Sudan. From *A. spirocarpa* it is usually recognisable by the narrower, glabrous pod, larger leaflets and glabrous branchlets, but material collected recently by Mr. G. Aylmer, Research Officer of the Anglo-Egyptian Sudan Forest Service, shows that intermediate forms occur which combine the characters of both species. Whether these are hybrids remains to be proved. It seems possible, on the other hand, that we may be dealing with an "aggregate" species which at its centre of dispersal (presumably the eastern Sudan or adjacent Abyssinia) shows a general tendency to variation in the indumentum and in pod measurements (in the same way that *A. arabica* tends to vary), and that the strain which has migrated westwards (*A. tortilis*) has retained the glabrous character, while the one which has travelled southwards (*A. spirocarpa*) has remained pubescent.

Whether we are dealing with two species which have hybridised, or with an "aggregate" species showing tendency to segregation in different geographical areas, it seems desirable from the forestry point of view to retain the two extreme forms as "species," and to name the intermediates as "varieties." This treatment facilitates the work of the Forest Officer.

Schweinfurth has, already, named a var. *b. minor* of *A. spirocarpa*. He named, also, a var. *a. major*, but by this he appears to have indicated the typical form, thus treating *A. spirocarpa* as an aggregate species composed of the two varieties, *major* and *minor*. To those who adhere to the binomial system of nomenclature, the name *A. spirocarpa* var. *major* Schweinf. thus becomes a synonym of typical *A. spirocarpa* Hochst.

In addition to *A. spirocarpa* var. *minor* there is a form, collected by Mr. Aylmer, which is intermediate in character, having more or less the indumentum of *A. spirocarpa*, and the narrow pod and longer leaflets of *A. tortilis*. This we propose to call *A. tortilis* var. *pubescens*.

After removing these intermediates into the rank of varieties, the two species *A. spirocarpa* and *A. tortilis* are left with the characters indicated in the following clavis :

Leaflets 1-3 mm. long, less than 1 mm. broad, 7-15 jugate ; pinnae 4-10-jugate : rhachis of leaves distinctly hirsute with whitish hairs : pod pubescent, turgid, broad (7-9 mm. broad when mature), often minutely dotted with blackish or reddish glands : branchlets greyish tomentose, often somewhat light chestnut-brown and indistinctly and finely striate beneath the indumentum

1. *spirocarpa*

Leaflets 3-6 mm. long, often 1 mm. broad or more, 8-12-jugate ; pinnae 2-6-jugate : pod glabrous, narrowly linear, flat, 5-7 mm. broad when mature : branchlets glabrous or glabrescent, often dark purplish brown, distinctly and more coarsely striate than in *A. spirocarpa* 2. *tortilis*

A. *spirocarpa* Hochst. in A. Rich. Tent. Fl. Abyss. 1 : 239 (1847) : *A. spirocarpa* var. *major* Schweinf. in Linnaea 35 : 323, t.5.

Abyssinia, *Schimper* 502 ! 612 ! 658 ! (co-types) 1747 ! *Schweinfurth* 1085 ! 1691 ! *Beccari* 87 ! Eritrea, *Chiovenda* 165 ! Nubia : Otao, *H. H. Johnston* 3 !

Anglo-Egyptian Sudan : between Atbara and the Red Sea, *Schweinfurth* 1973 ! 1975 ! (form with narrow pods, 5 mm. broad). Arabia : Aden, Goldmore Valley, *Barbey* 63 !

Tanganyika Terr. : Mpwapwa, *Harnby* 58 ! Kyimbila Dist. (Tukuyu country), *Stolz* 1674 ! Locality ? *Busse* 277 ! Dodoma, *Burt* 998 ! 1644 ! *Greenway* 772 ! Kondoia Iranga, *Burt* 1319 ! Usambara, Nyika *Taubert* 2405 ! Doda, *Taubert* 2932 !

Native names : "Mugunga" (Tang.) ; Mwalaganza (Kigo).

Schimper No. 1747, named *A. spirocarpa* by *Hochstetter* (but questioned by him as, possibly, a variety of *A. seyal*) is not cited

by Richard; it has the broad pod of *A. spirocarpa*, which is tomentellose.

Var. **minor** *Schweinf.* Pinnae 4-5-jugate; leaflets 10: capitula very small: pods small (5 cm. long, 4-seeded), narrow (4 mm. broad), in the type specimen hirsute with spreading whitish hairs.—Anglo-Egyptian Sudan: Gebel Uaratab, near Suakin, *Schweinfurth* 1966! (type).

Pods of a form collected by Greenway in Tanganyika Terr., (772b), clothed with stiff spreading white hairs 3-5 mm. long, may belong here, but leaves are not available for comparison.

A. tortilis (*Forsk.*) *Hayne*, *Arnzeig.* Gewasche 10: t. 31 (1827); *Mimosa tortilis* *Forsk.*?—Forsk. *Mimosa tortilis* "must be either *A. spirocarpa* or *A. tortilis*" but as Bentham states (*Mimoseae*, p. 505) the characters given by Forskal are "insufficient for determination." Hayne cites Forskal's description and Ehrenberg's specimens.

Arabia, prope Haes, *Forsk.* (type of *Mimosa tortilis*). Anglo-Egyptian Sudan, Libyan and Nubian Deserts and Dongola: Syene (Assouan), *Ehrenberg* s.n.! *Sieber*! (types of *Acacia tortilis*). Egypt: *Raddi* s.n.!; between Kosser and Ras-Benass, *Schweinfurth* 1985! W. Africa: French Sudan, *Chevalier* 1186! Senegambia (collector?) 499! in *Herb. Kew*; *Heudelot* s.n. Nigeria, Northern Provinces (collector? s.n., in *Herb. Kew*).

Native name: Kindil (N. Nigeria).

Var. **pubescens** *Aylmer*, var. nov.—Differs from the type in the pubescent to glabrescent branchlets, spines, rhachis and pods. Pinnae 4-5 jugate; leaflets 8-13 pairs, sparsely ciliate, 3 mm. long and 1 mm. broad: peduncle 2-2.5 cm. long, slender, pubescent, with involucre near the middle; heads cream-coloured.—Medium-sized tree, slash green; bark brown. Flowering 25 Nov. 1929 (*Aylmer*).

Anglo-Egyptian Sudan: Khartoum, in clay soil near the river, *G. Aylmer* 7; Khartoum, kilo. 8 on Medani railway, 16 Aug. 1928, *G. Aylmer* x8! (type in *Herb. Kew*); Darmont Isl. on the Nile, *Letourneux* 257! Blue Nile near Wad Medani, flowering Nov. 1900, *Muriel* S/9.

A form intermediate between *A. tortilis* Hayne and *A. spirocarpa* Hochst., differing from the latter in the narrow rather torulose pod, fewer pinnae, larger leaflets, and less pubescent branchlets.

Native name: Seyal (Arabic).

F. v. Mueller states (*Select Extra-tropical Plants*, ed. 9, p. 14) that "the Sahara gum arabic is derived from" *Acacia tortilis*. Mr. Aylmer informs me, however, that though this a gum-yielding species, it is not one of the sources of the commercial gum collected in the Sudan.

The material cited in this note has been studied in the herbarium of the Royal Botanic Gardens, Kew, through the courtesy of the Director.

Casearia calva Craib [Samydaceae]; a *C. glomerata* Roxb. pedicellis glabris recedit.

Arbor circa 10 m. alta (ex *Kerr*); ramuli iuventute sicco fusci, angulati, inconspicue puberuli, demum cortice cinereo-brunneo obtecti, striati, lenticellati. *Folia* anguste oblonga, oblongo-lanceolata, vel oblongo-oblancoolata, apice obtuse acuminata, basi inaequilateralia, latere altero cuneata, altero late cuneata vel rotundata, usque ad 25 cm. longa et 6.5 cm. lata, rigide chartacea, glabra, sicco brunnescentia, nervis lateralibus utrinque circa 12 supra conspicuis vel subconspicuis subtus prominentibus, rete subtus subprominulo, margine subintegra, anguste cartilaginea, parum recurva, petiolo 8–16 mm. longo supra canaliculato sicco fusco glabro suffulta; stipulae deciduae, subdeltoideae, obtusae, 2 mm. longae, glabrae. *Flores* virides (ex *Kerr*), e ligno annotino orti, tuberculis mediocribus parum obliquis; pedicelli supra articulationem circa 6 mm. longi, glabri. *Receptaculum* breve. *Calycis* segmenta 5, elliptica vel ovato-elliptica, apice rotundata, saltem interiora margine membranacea, ad 4 mm. longa et 3 mm. lata. *Stamina* 8, filamentis 2 mm. longis, antheris paulo ultra 0.5 mm. longis; staminodia 8, filamentis dimidio breviora, apice pilosa. *Pistillum* glabrum, stamina paulo superans, ovario in stylum brevem angustato, stigmatibus capitato.

Chawm Tawng, Mé Ya, 1000 m., evergreen forest, *Kerr* 5365.

Casearia oblonga Craib [Samydaceae]; a *C. Kurzii* C. B. Clarke pedicellis brevioribus, a *C. vareca* Roxb. pedicellis supra articulationem haud glabris inter alia recedit.

Arbor circa 6 m. alta (ex *Kerr*); ramuli iuventute fusci, parum angulati, subsparse pubescentes, mox straminei, annotini brunneo-straminei, puberuli, lenticellati. *Folia* oblonga vel suboblonga, apice saepissime subitius acuminata, obtusa, basi cuneata vel cuneato-rotundata, haud rarius inaequilateralia, latere altero cuneata, altero cuneato-rotundata, ad 13 cm. longa, 5 cm. lata, coriaceo-chartacea, sicco saepissime supra fuscescentia, subtus pallidiora, supra parce puberula, subtus ad costam nervosque laterales pubescentia, aliter parce pubescentia, costa supra parum impressa subtus prominente, nervis lateralibus utrinque circa 7 intra marginem anastomosantibus supra conspicuis vel parum impressis subtus prominentibus, nervis transversis numerosis subhorizontalibus inter se plus minusve parallelis supra argute subprominulis subtus prominulis, margine recurva, distanter denticulata, petiolo subgracili circa 1 cm. longo sicco fusco breviter pubescente supra canaliculato suffulta; stipulae parvae, deciduae. *Flores* in fasciculos axillares dispositi, pedicellis 4 mm. longis sicco fuscis supra articulationem subadpresse pubescentibus suffulti. *Receptaculum* paulo ultra 1 mm. longum, dorso subadpresse pubescens. *Calycis* segmenta 4 vel 5, saepissime plus

*Continued from *K.B.* 1930, p. 327.

minusve elliptica, apice rotundata, usque ad 2.5 mm. longa et 2 mm. lata, sicco fusca, saltem exteriora dorso praesertim medium versus adpresse pubescentia. *Stamina* 6, filamentis 1.5 mm. longis parce subrigide pilosis, antheris parvis; staminodia 6, circa 1 mm. longa, filamentis similia nisi paulo crassiora, similiter pilosa. *Pistillum* pilis paucis albis erectis instructum; ovarium stylo subaequilongum, circa 1 mm. longum, placentis duabus.

Chumpawn, Siep Yuan, 10 m., evergreen forest, *Kerr* 16246.

Casearia pallida *Craib* [Samydaceae]; a *C. andamanica* King ramulis pallidis, foliis tenuioribus basi latioribus, nervis lateralibus magis numerosis recedit.

Arbor circa 15 m. alta (ex *Kerr*); ramuli glabri, primo compressi, sulcati, sicco iuventute fusci, mox straminei vel substraminei, demum teretes, cortice cinereo obtecti, lenticellis haud conspicuis. *Folia* saepissime oblonga, rarius ovato-oblonga, apice acuminata, basi parum inaequilaterialia, latere altero cuneata vel late cuneata, altero late cuneata vel rotundata, 13–25 cm. longa, 5.5–8 cm. lata, chartacea, iuventute pilis brevibus adpressis instructa, matura glabra, sicco pallide viridia vel pallide brunneo-viridia, costa supra plana vel parum elevata subtus prominente, nervis lateralibus utrinque 12–15 intra marginem anastomosantibus supra conspicuis subtus prominentibus, nervulis rete pagina utraque subprominulum efficientibus, margine subdistanter denticulato-crenulata, anguste cartilaginea, parum recurva, petiolo circa 1.5 cm. longo glabro supra canaliculato suffulta; stipulae deciduae, late deltoideae, obtusae, circa 2 mm. longae et latae, brunneae. *Fructus* luteus (ex *Kerr*), e tuberculis axillaribus in ramulis defoliatis ortus, pedicello recto vel parum curvato prorsus directo circa 12 mm. longo basi articulo stramineo suffultus, basi calycis segmentis 5 plus minusve persistentibus reflexis subellipticis obtusis 4 mm. longis 3 mm. latis glabris et staminodiis paucis pilosis instructus, ambitu oblongus, apice angustatus, circa 4.5 cm. longus et 2 cm. diametro, valvis tribus; semina 6 mm. longa, arillo subcarnoso apice longe fimbriato tecta.

Songkla, Ban Prakawp, 50 m., light evergreen forest, *Kerr* 15855.

Adenia angustisepala *Craib* [Passifloraceae-Adenieae]; ab *A. linearis* Craib et *A. parvifolia* Gagnep. calycis segmentis angustis elongatis, ab illa receptaculi tubo breviora, disci glandulis haud linearibus, ab hac antheris haud apiculatis inter alia recedit.

Caules herbacei, sicco brunnei vel saepius pallidi, glabri, striati, inflorescentiae rhachi in cirrhum producta scandentes. *Folia* oblonga, oblongo-lanceolata, vel oblongo-oblanceolata, apice acute acuminata, basi rotundata vel truncata, 4.5–8.5 cm. longa 1.8–3 cm. lata, chartacea vel rigide chartacea, sicco brunnea vel luteo-viridia, glabra, nervis lateralibus utrinque 5–7 supra conspicuis subtus prominulis bene intra marginem anastomosantibus, reticulatione

subtus plus minusve prominula, integra, ima basi glandulosa, petiolo 4-6 mm. longo pallido anguste peltatim affixo suffulta. *Pedunculus* communis axillaris, 2-3 cm. longus, glaber, apice cymam paucifloram et cirrhum gerens; pedicelli circa 5 mm. longi, glabri, fere ad medium articulati, basi parvi-bracteati. *Receptaculum* circa 3 mm. longum. *Calycis* segmenta 5, linearia, obtusa, 1 cm. longa, 1.5 mm. lata, glabra. *Petala* 5, spatulata, circa 5 mm. longa et 1.25 mm. lata, glabra, nervis tribus paulo infra apicem prominenter coniunctis. *Antherae* lineares, 3.5 mm. longae, haud apiculatae, loculis basi inter se liberis. *Disci* glandulae parvae.

Kaw Tao, c. 10 m., open evergreen forest on rocky ground, *Kerr* 12812.

***Adenia linearis* Craib** [Passifloraceae-Adenieae]; ab *A. nicobarica* King foliis conspicue angustioribus, fructu minore breviter stipitato ab *A. parvifolia* Gagnep. disci glandulis linearibus, antheris haud apiculatis recedit.

Caules herbacei, sicco primo subfusci, mox pallide virides, glabri, striati, inflorescentiae rhachi in cirrhum producta scandentes. *Folia* anguste oblonga vel oblongo-oblancheolata, apice acute acuminata vel subacuminata, basi rotundata, 7-10 cm. longa, 1.7-3 cm. lata, chartacea vel rigide chartacea, sicco supra viridia, subtus luteo-viridia vel pagina utraque interdum lutescentia, glabra, nervis lateralibus utrinque 5-6 bene intra marginem anastomosantibus supra plus minusve conspicuis subtus subprominentibus paucis aliis tantum paulo minus conspicuis interiectis, nervulis rete laxum subtus subprominulum efficientibus, integra, ima basi glandulosa, petiolo 7-13 mm. longo supra canaliculato anguste peltatim affixo suffulta. *Pedunculus* communis axillaris, 2-2.5 cm. longus, glaber, apice cymam paucifloram solitariam vel cymas duas laterales gerens, rhachi in cirrhum producta; pedicelli circa 5 mm. longi, infra medium articulati, basi bractea lineari circa 1 mm. longa instructi. *Receptaculi* tubus 3 mm. longus. *Calycis* segmenta 5, oblongo-ligulata, apice rotundata, 6 mm. longa, 1.75 mm. lata, glabra. *Petala* 5, oblongo-oblancheolata, obtusa, circa 4 mm. longa et 1.5 mm. lata; glabra, apicem versus pauci-denticulata, nervis tribus prominentibus infra apicem arcuatim coniunctis. *Disci* glandulae 5, lineares, apice recurvae, circa 1.25 mm. longae et 0.25 mm. latae. *Antherae* lineares, 3.5 mm. longae, haud apiculatae, loculis basi inter se liberis. *Fructus* ruber (ex *Kerr*), stipite circa 5 mm. longo incluso 4.8 cm. longus, valvis tribus.

Satul, 5 m., climbing on bushes in scrub, *Kerr* 13725.

***Adenia saxicola* Craib** [Passifloraceae-Adenieae]; ab *A. pinna-tisecta* Craib floribus brevioribus, petalis basi latioribus, disci glandulis minoribus, antheris brevius mucronatis differt.

Caules herbacei, glabri, sicco striati, pallidi, interdum subglauci, rarius brunnei, inflorescentiae rhachi in cirrhum producta scandentes. *Folia* alterna, variabilia, oblongo-lanceolata, breviter apiculata,

basi rotundata vel truncata, ad 11 cm. longa et 4 cm. lata, oblongo-quadrata, pauci-lobulata, ad 8 cm. longa et 6.5 cm. lata, vel pinnatim 5-lobata, ad 9 cm. longa et 13 cm. lata, lobis integris saepissime oblanceolatis apice breviter apiculatis usque ad 6 cm. longis et 1.8 cm. latis, chartacea, glabra, sicco supra brunnescentia, subtus glauca, costa supra conspicua subtus prominente, e basi 5-nervia, nervis lateralibus utrinque solitariis paulo supra basem e costa ortis, nervis supra conspicuis subtus prominentibus, nervulis rete laxum pagina utraque vix conspicuum efficientibus, foliis lobatis subtus inter lobos et paulo infra eos glandula solitaria instructis, ima basi ad petioli apicem conspicue glandulosa, petiolo ad 3 cm. longo glabro suffulta. *Inflorescentia* axillaris, pedunculo communi 3-7 cm. longo suffulta, apice ramulos duos floriferos ad 1.5 cm. longos gerens, rhachi in cirrhum producta, pedicellis circa 1 cm. longis paulo infra medium articulatis, bracteis minutis. *Fl. masc.* pallide viridis (ex Kerr). *Receptaculum* circa 3 mm. longum. *Calycis* segmenta 5, lanceolata, subacuta, 8-9 mm. longa, 2.5 mm. lata, glabra. *Petala* 5, oblonga, apice rotundata, 8 mm. longa, 4 mm. lata, breviter unguiculata, conspicue nervosa, anguste fimbriata. *Disci* glandulae parvae, pilosae. *Stamina* 5, filamentis 1.5 mm. longis, antheris 2.25 mm. longis apice mucrone gracile 1.25 mm. longo instructis. *Pistillodium* ad receptaculi tubi basem positum, paululo ultra 1 mm. altum. *Fructus* vix maturus subellipsoideus, stipite circa 4 mm. longo incluso circa 5 cm. longus, ima basi calyce persistente instructus.

Chiengmai, Mê Tûn, 1000 m., trailing over rocks in open forest, Kerr 6226.

Alsomitra plena Craib [Cucurbitaceae-Fevilleae]; a speciebus aliis adhuc descriptis staminodiis bene evolutis recedit.

Herba cirrhis axillaribus saepissime apice bifidis scandens; ramuli pilis brevibus glanduloso-capitatis et paucis aliis paulo longioribus haud glandulosis breviter pubescentes, sicco virides, graciles, sulcati, obtuse angulati. *Folia* ambitu ovata vel subquadrata, basi cordata, ad 7.5 cm. longa et 9 cm. lata, trilobata vel ad basem trisecta, segmentis oblanceolatis apice acute acuminatis medianis pauci-lobulatis lateralibus latere exteriori pauci-lobulatis membranaceis sicco plus minusve viridibus pagina utraque pilis brevibus sparse instructis ciliolatis nervis lateralibus utrinque circa 4 subtus conspicuis, eglandulosa, petiolo ad 2.5 cm. longo indumento ei ramulorum simili instructo suffulta. *Panicula* mascula pedunculo communi ad 1.5 cm. longo incluso ad 15 cm. longa, ramis inferioribus ad 3 cm. longis, indumento ei ramulorum simili instructa; pedicelli graciles, 7 mm. longi, pilis brevibus glanduloso-capitatis puberuli; bractae lineares, 2 mm. longae, similiter puberulae. *Sepala* 5, lanceolata, acuta, 2.5 mm. longa, 0.75 mm. lata, dorso parce breviter pubescentia. *Petala* 5, ovato-rhomboidea, apiculata, 4 mm. longa, 2.75 mm. lata, conspicue nervosa, glabra. *Stamina* 5, filamentis inter se omnino liberis 1 mm. longis, antheris subrotundatis fere

0.75 mm. diametro dorso apicem versus macula fusca notatis. *Fl.* ♀ pedicellis eis masculi similibus suffulti, bracteis etiam similibus vel interdum foliaceis. *Receptaculum* 5 mm. longum, ad ovarium glabrum, supra ovarium tubuloso-productum et ibi dorso parce breviter pubescens. *Calyx* et *corolla* iis floris masculi subsimiles. *Staminodia* ut filamenta sepalis dimidio breviora evoluta. *Styli* 3, inter se liberi, stigmatibus semilunaribus. *Capsula* pallida, subglauca, ambitu oblonga, 4 cm. longa, circa 1 cm. diametro, apice tubuloso-producta, pedicello 1 cm. longo suffulta. *Semina* straminea, apice ala membranacea fere 5 mm. longa instructa, ala exclusa, 5-6 mm. longa, 3 mm. lata, parum compressa, 1 mm. supra basem contracta, ima basi obtusa, lateraliter paucituberculata.

Prachuap, Kao Tao, 10 m., climbing on bushes in scrub, *Kerr* 16191 (♂), 16191A (♀).

Alsomitra simplex *Craib* [Cucurbitaceae-Fevilleae]; a speciebus aliis foliis simplicibus adhuc descriptis foliis integris nec angulatis nec crenulatis recedit.

Caules herbacei, scandentes, sicco substraminei, pilis et brevibus glanduloso-capitatis et paulo longioribus non glandulosis tecti, sulcati; cirrhi apice bifidi. *Folia* ovata lateve ovata, apice subacute acuminata, basi altius cordata, usque ad 18 cm. longa et 12.5 cm. lata, membranacea, sicco plus minusve fuscescentia, supra ad costam nervosque breviter pilosa, aliter puberula, subtus indumento simili sed paulo densiore instructa, e basi 5-nervia, nervis e costa ortis utrinque circa 4, omnibus supra conspicuis subtus prominulis intra marginem anastomosantibus, nervulis rete laxum plus minusve conspicuum formantibus, margine integra, ciliolata, petiolo ad 4.5 cm. longo supra canaliculato indumento ei caulium simili instructo suffulta. *Panicula* mascula pedunculo communi circa 3.5 cm. longo incluso 10 cm. longa, indumento ei ramulorum simili tecta, pauciramosa, ramis inferioribus circa 2 cm. longis; flores pallide virides (ex *Kerr*), pedicellis 4 mm. longis suffulti; bractee parvae, angustae. *Calyx* dorso pilis et glanduloso-capitatis et non glandulosis sparse instructus; segmenta 5, deltoideo-lanceolata, subacuta, paululo ante anthesin 2 mm. longa. *Petala* 5, elliptico-ovata, apiculata, sepalis subaequilonga, glabra, intra medio carinata. *Stamina* 5, inter se omnino libera, filamentis 1 mm. longis, antheris suboblongis circa 0.5 mm. longis.

Betong, 200 m., climbing on trees by stream in evergreen forest, *Kerr* 7524.

Begonia demissa *Craib* [Begoniaceae]; inter species floribus minoribus foliis basi aequalibus truncatis vel late cordato-truncatis fere glabris, alabastris elongatis, antheris lineari-oblongis distincta.

Herba inflorescentia inclusa ad 13 cm. alta, rhizomate repente, caule ad 10 cm. longo saepissime apice folia duo opposita gerente. *Folia* et basilaria et caulinaria, deltoidea vel fere oblata, apice obtuse

acuminata vel subacuminata, basi truncata vel cordato-truncata, aequilaterialia, usque ad 9 cm. longa et 8.5 cm. lata, membranacea, sicco viridia vel interdum pallide purpureo-suffusa, supra setis sparsis hic et illic instructa, subtus glabra, e basi 7-nervia, nervis intra marginem ramosis cum ramulis ad marginem currentibus supra conspicuis subtus prominulis, margine irregulariter crenulata vel crenulato-denticulata, sparse setosa, basalia petiolo 4-5.5 cm. longo suffulta, caulinaria saepissime brevius petiolata; stipulae parvae, deltoideae. *Cymae* axillares, pedunculo communi 2.5-5 cm. rarius ad 8 cm. longo suffultae, ad 2.5 cm. longae, glabrae; flos terminalis pedicello 2 cm. longo suffultus; rami laterales ad 2 cm. longi, iterum cymosim furcati; bracteae deciduae, vix 0.5 mm. longae. *Floris* ♂ perianthii partes 4; duae exteriores ellipticae, sicco ad 8 mm. longae et 4.5 mm. latae, glabrae vel interdum pilis paucis elongatis instructae; duae interiores elliptico-oblongae, exterioribus subaequilongae, sicco 3 mm. latae, glabrae. *Androeceum* 4 mm. altum, filamentis inter se inferne connatis apice liberis, antheris circa 15 secundis oblongis ad 1.75 mm. longis apicem versus breviter dehiscentibus, connectivo breviter obtuse producto. *Floris* ♀ alabastrum juvenile tantum visum. *Receptaculum* glabrum, inaequaliter 3-alatum. *Ovarium* receptaculo paulo brevius.

Kanburi, Baw Re, *Put* 218.

***Begonia discreta* Craib** [Begoniaceae]; ab affini *B. Putii* Craib foliis maioribus, staminibus magis numerosis, receptaculo glabro, inter alia recedit.

Herba acaulis, tuberosa. *Folia* oblonga, oblongo-ovata, vel subquadrata, apice acuminata, acuta, basi altius cordata, aequilateralia vel interdum parum inaequilaterialia, 4.5-13 cm. longa, 3.5-9 cm. lata, chartacea, sicco plus minusve brunnescentia, pagina superiore setulis brevibus hic et illic sparse instructa, inferiore ad nervos sparse ferrugineo-pilosa, aliter pilis paucis hic et illic instructa, rarissime fere glabra, nervis e basi radiantibus ad 9, nervis secundariis (e costa ortis) utrinque 3-4, omnibus supra conspicuis vel parum impressis subtus prominentibus, nervis transversis paucis subtus plus minusve conspicuis, petiolo 3-8.5 cm. longo apicem versus parce piloso rarissime subglabro suffulta. *Inflorescentia* pedunculo communi ad 18 cm. longo incluso usque ad 28 cm. longa, bracteis et perianthio exclusis glabra, ramulis inferioribus usque ad 8 cm. longis, ramulis ultimis saepissime 5-7 mm. longis; bracteae mediocres, deciduae, margine pilis elongatis glanduloso-capitatis ciliatae; pedicelli sub anthesin 5-10 mm. longi. *Perianthii* floris ♂ segmenta 4; duo exteriora subelliptica, ad 11 mm. longa et 7 mm. lata, dorso pilis paucis elongatis instructa, duo interiora oblongo-oblongeolata, circa 10 mm. longa et 2.5 mm. lata, glabra. *Stamina* circa 12, filamentis basi ad 1 mm. in columnam connatis apice breviter liberis, antheris circa 1 mm. longis, connectivo haud producto. *Perianthium* floris ♀ ei masculi simile sed paulo minus et fere glabrum. *Receptaculum* glabrum, 4 mm. longum, apicem versus inaequaliter trialatum, ala

maiore 2 mm. longa pauci-denticulata. *Styli* 3, circa 2 mm. longi, ad medium inter se connati, stigmatibus semilunariibus haud tortis ; ovarium 3-loculare, placentis bifidis.

Doi Sutep, 1350 m., on rocks, *Kerr* 3442.

Begonia festiva *Craib* [Begoniaceae] ; species nova caule prostrato, radicante, stipulis foliaceis diu persistentibus, pedunculo communi foliis longiore, floribus inter maiores albis distincta.

Caulis sat crassus, radicans, inferne stipulis marcidis tectus. *Folia* obliqua, inaequilaterialia, latere altero dimidiatim late ovata, altero dimidiatim ovata, ambobus basi auriculatis, auriculis ad 3.5 cm. longis imbricatis, 11-14 cm. longa, 8-10 cm. lata, subcrassa, supra viridia, pilis brevibus subsquamiformibus sparse instructa, subtus pallide viridia, ad nervos pilis similibus instructa, nervis e basi radiantibus 7-9 supra conspicuis subtus prominentibus, margine denticulata, dentibus reflexis, petiolo crasso 7-11 cm. longo rubro-suffuso pilis brevibus saepissime basi incrassatis tecto suffulta ; stipulae diu persistentes, foliaceae, inaequilateraliter subflabelliformes, 1.5 cm. diametro, dorso pilis paucis crassis instructae, supra glabrae, fimbriato-ciliatae. *Inflorescentia* axillaris, folia fere duplo superans, pedunculo communi circa 15 cm. longo incluso ad 30 cm. longa, pedunculo inferne glabro superne cum ramulis pilis brevibus glanduloso-capitatis puberulo viridi inferne et ad nodos rubro-suffuso, pedunculis partialibus 3.5 cm. longis, ultimis circa 5 mm. longis ; bractee deciduae, circa 7 mm. longae ; pedicelli pallidi, 1.8-2 cm. longi, pilis brevibus glanduloso-capitatis puberuli ; flores albi, apice margine interdum rubro-suffusi. *Perianthium* ♂ 4-merum ; segmenta duo exteriora obovato-elliptica vel subrotundata, ad 2.2 cm. longa et 2 cm. lata, duo interiora oblongo-oblancoolata, obtusa, 16 mm. longa, 8 mm. lata. *Stamina* lutea, numerosa, filamentis inter se e basi liberis exterioribus circa 1.5 mm. longis, antheris cuneato-oblongis, connectivo supra loculos producto apice truncato. *Perianthium* ♀ 5-merum ; segmenta exteriora subelliptica, ad 1.5 cm. longa et 1.3 cm. lata, intimo spatulato-oblongo 8 mm. longo 5 mm. lato, glabra. *Receptaculum* album, hic et illic pilis brevibus glanduloso-capitatis puberulum, inaequaliter 3-alatum, ala maiore margine superiore horizontali apice rotundata 9 mm. longa et lata nervis horizontalibus vix conspicuis, alis minoribus vix 1 mm. longis. *Ovarii* loculi 3, placentis bifidis ; styli 3, fere e basi inter se liberi, bilobati, stigmatibus luteis papillois spiraliter tortis.

Raised at Aberdeen from seed collected by Dr. Kerr on Kao Nawng in Surat at 1000 m.

Begonia Garrettii *Craib* [Begoniaceae] ; herba folia duo altero basali altero ad inflorescentiae basem saepissime gerens, foliis membranaceis pinnatim lobatis vel pinnatisectis lobis vel segmentis lobulatis, fructu iuvenili ambitu oblongo distincta.

Rhizoma repens, apice folium solitarium gerens ; caulis 5-17.5 cm. longus, glaber, apice folium solitarium vel rarissime folia duo

opposita et inflorescentiam gerens. *Folia* ambitu ovata vel late ovata, basalia basi alte cordata, 18–32 cm. longa, 16–36 cm. lata, caulinarum basi truncata vel truncato-cordata, 6.5–11 cm. longa, 5.5–11 cm. lata, pinnatim lobata vel pinnatisecta, lobis vel segmentis utrinque 2–3 lobulatis apice angustatis summo apice acutis, membranacea, sicco plus minusve brunnescentia, pagina superiore setulis perpaucis brevibus, inferiore ad nervos pilis paucis longiusculis instructa, basalia petiolo 9–22 cm. longo pilis perpaucis longiusculis instructo vel fere glabro, caulinarum petiolo 1.5–5.5 cm. longo suffulta. *Cymae* et axillares et terminales, sub anthesin pedunculo communi 4.5–8.5 cm. longo glabro suffultae, pedunculo demum ad 16.5 cm. longo apice bracteis duabus stipulis similibus sed minoribus instructo saepissime furcato, pedunculis partialibus ad 2 cm. longis, pedunculis ultimus ubi evolutis circa 1 cm. longis; flores albi, violaceo-rubro-suffusi (ex *Garrett*). *Flos* stamineus pedicello circa 1 cm. longo parce puberulo suffultus. *Perianthii* segmenta 4; duo exteriora elliptica, apice rotundata, 10 mm. longa, 7.5 mm. lata, dorso pilis paucis pallidis instructa, duo interiora obovata, 8 mm. longa, 5 mm. lata, glabra. *Stamina* circa 20, filamentis usque ad 1 mm. longis inter se liberis, antheris 1 mm. longis. *Flos* ♀ pedicello paulo ultra 1 cm. longo puberulo suffultus. *Perianthii* segmenta 5, iis floris ♂ subsimilia. *Receptaculum* 8 mm. longum, alis tribus inclusis apice 4.5 mm. latum, alis supra ovarium productis subaequalibus apice ad 2 mm. longis. *Ovarium* 6 mm. longum; styli 3, e basi inter se liberi, 2 mm. longi, stigmatibus semilunaribus haud tortis 0.75 mm. longis pilulosis; loculi 3, placentis bilamellatis. *Fructus* fere maturus pedicello 3.5 cm. longo suffultus, alis inclusis 2.2 cm. longus, apice 1.2 cm. latus, alis tribus apice 4 mm. longis horizontaliter nervosis inferne evanidis.

Doi Angka, E. slope ending in Doi Pa Mawn, 1450 m., on rocks, *Garrett* 462.

Begonia incondita *Craib* [Begoniaceae]; species habitu *B. venustae* King similis sed foliis lobulatis fere glabris, nervulis fere omnibus obscuris, floribus minoribus, antheris multo minoribus inter alia recedit.

Rhizoma usque ad 1 cm. crassum; caulis vix evolutus vel ad 6 cm. longus, unifolius, paucipilosus. *Folia* basalia pauca, obliqua, latere altero dimidiatim late ovata, altero dimidiatim ovata, basi alte oblique vel subaequaliter latius cordata, apice acute acuminata, usque ad 15 cm. longa et 13 cm. lata, membranacea, pagina utraque granulata, supra glabra, subtus primo ad nervos pilis paucis instructa, mox glabra, e basi 7-nervia, nervis supra conspicuis subtus prominentibus, nervulis obscuris, margine lobulata vel sinuato-lobulata, pauci-setoso-denticulata, petiolo ad 27 cm. longo pilis paucis instructo suffulta; folia caulinarum solitaria, basalibus similia nisi paulo minora. *Inflorescentia* terminalis, corymbiformis, pedunculo communi ad 21 cm. longo suffulta, pedunculis partialibus 4–6 cm. longis iterum ramosis cum pedunculo communi pilis divergentibus

subsparsae instructis; pedicelli graciles, circa 2 cm. longi, pilis paucis instructi; flores pallide punicei (ex *Kerr*). *Perianthii* ♂ partes 4; duae exteriores oblongo-ellipticae, 14 mm. longae, 8 mm. latae, dorso pilis paucis elongatis instructae; duae interiores oblongo-oblancheolatae, obtusae, 10 mm. longae, 3.5 mm. latae, glabrae. *Stamina* numerosa, filamentis inter se liberis usque ad 3 mm. longis, antheris oblongo-obtriangularibus 1.25 mm. longis connectivo laud producto. *Floris* ♀ perianthium ei ♂ subsimile. *Receptaculum* 3-alatum, circa 6 mm. longum, alis inclusis apice 4 mm. latum, supra ovarium productum, pilis paucis elongatis instructum. *Styli* 3, inter se liberi, 1.5 mm. longi; stigmata papillosa, apice torta; placentae bilamellatae. *Fructus* 1 cm. longus, alis inclusis 2 cm. latus, inaequaliter 3-alatus, ala maiore 12 mm. longa basi 7 mm. lata obtusa horizontaliter nervosa, alis minoribus 1.5 mm. longis.

Nakawn Sritamarat, Kao Luang, 900 m., on rocks in evergreen forest, *Kerr* 15457.

***Begonia obovoidea* Craib** [Begoniaceae]; species caule erecto, foliis palmatim lobatis, fructu obovoideo, alis tantum paululo ultra 1 mm. latis distincta.

Caulis simplex, erectus, ad 26 cm. altus, ruber (ex *Kerr*), nodis inferioribus radicans, primo pilis brevibus parce instructus, demum glaber. *Folia* omnia caulinarum, ambitu rotundata vel quadrato-rotundata, basi late altius cordata, ad 21 cm. diametro, plus minusve ad medium palmatim 7-9-lobata, lobis lanceolatis vel late lanceolatis acutis circa 8 cm. longis et 3 cm. latis interdum paucilobulatis, membranacea, sicco supra fusco-viridia vel brunnea, subtus pallide brunnea, supra setulis sparsissime instructa, subtus ad nervos parce pilosula, e basi 7-nervia, nervis lateralibus ex iis ortis utrinque 2-3, omnibus supra conspicuis subtus prominentibus, nervulis paucis subtus conspicuis, margine irregulariter sparse denticulata vel subintegra, petiolo circa 17 cm. longo indumento ei caulis simili instructo suffulta. *Cymae* breves, axillares. *Flos* stamineus pedicello 8 mm. longo puberulo suffultus. *Perianthii* segmenta duo exteriora subelliptica, apice rotundata, 7 mm. longa, 5 mm. lata, dorso praesertim inferne pilis brevibus instructa, duo interiora exterioribus parum minora, glabra. *Stamina* numerosa, filamentis inter se liberis interioribus ad 1.5 mm. longis, antheris linearibus 2 mm. longis, connectivo breviter obtuse producto. *Fructus* pedicello 2.5 cm. longo suffultus, ambitu obovatus, 1.6 cm. longus, 1.3 cm. latus, stylis tribus liberis bifidis stigmatibus elongatis tortis coronatus, ferrugineo-puberulus, superne anguste alatus, alis paululo ultra 1 mm. longis.

Ranawng, Nam Chut, 75 m., by stream in evergreen forest, stem edible, *Kerr* 12902.

***Begonia prolixa* Craib** (Begoniaceae); a *B. venusta* King floribus multo minoribus, a *B. rege* Putz. petiolis multo longioribus haud barbatis recedit.

Herba acaulis; rhizoma repens, stipulis saltem paucis persistentibus instructum. *Folia* obliqua, apice acute acuminata, latere altero dimidiatim subelliptica, basi cordata, altero dimidiatim late ovata, basi alte cordata, ad 16 cm. longa et 11 cm. lata, sicco supra brunnescentia, subtus pallidiora, pagina superiore pilis brevibus ferrugineis iuventute sparse instructa, matura glabra, inferiore ad nervos ferrugineo-piloso-tomentosa, nervis e basi radiantibus saepissime 7 supra conspicuis, subtus prominentibus nervulis paucis pagina utraque subconspicuis, denticulata, dentibus setosis, petiolo 20–25 cm. longo pilis ferrugineis adpressis instructo suffulta; stipulae deltoideo-lanceolatae, apice longius acute attenuatae, circa 1.2 cm. longae, diu persistentes. *Pedunculus* communis efoliatus, sub anthesin 11–18 cm. altus, infrutescens ad 33 cm. altus, indumento ei petiolorum simili primo instructus, pilis demum plus minusve deciduis; pedicelli 10–15 mm. longi, ferrugineo-furfuracei; flores albi (ex *Kerr*). *Floris* ♂ perianthii partes 4; duae exteriores subellipticae, 1.7 cm. longae, 1.1 cm. latae, dorso pilis ferrugineis brevibus sparse instructae. *Stamina* numerosa, filamentis liberis ad 1.75 mm. longis, antheris linearibus filamentis subaequilongis, connectivo obtuse producto. *Floris* ♀ perianthium ei ♂ subsimile. *Receptaculum* circa 6 mm. longum, alis inclusis 2.3 cm. altum, alis valde inaequalibus, maiore oblonga 1.5 cm. longa obtusa, duabus minoribus vix 5 mm. longis. *Styli* 2, stigmatibus spiraliter tortis. *Capsula* 12 mm. longa, alis inclusis 3.5 cm. lata, ala maiore oblonga 2.5 cm. longa 8 mm. lata nervosa, duabus minoribus triangularibus obtusis circa 8 mm. longis.

Pattani, Kao Kalakiri, 600 m., evergreen forest, *Kerr* 14926.

***Begonia pumila* Craib** [Begoniaceae]; species parva ab aliis orientalibus foliis glabris palmatim lobatis, lobis saepissime lobulatis, floris masculi perianthio 4-mero, androphoro evoluto, antheris subsessilibus parvis distincta.

Herba erecta, circa 5 cm. alta, glabra; caulis basi vix 2 mm. diametro, parum flexuosus, inferne vinosus, superne ruber, iuventute parce parvi-squamosus. *Folia* alterna, ambitu saepissime plus minusve oblata, apice obtusa, basi late cordata vel truncata, subpeltata, 1.3–3 cm. longa, 1.5–3.5 cm. lata, viva sat rigida, supra viridia, nitida vel subnitida, subtus pallide viridia, e basi 5-nervia, nervis pagina utraque conspicuis, nervis transversis vix conspicuis, palmatim 5-lobata, vel interdum lobis inferioribus interdum vix distinctis subtrilobata, lobis lobulatis vel sublobulatis, grossius crenato-serrata, petiolo 6–12 mm. longo parce squamoso rubro suffulta; stipulae lanceolatae vel deltoideo-lanceolatae, acutae, circa 2 mm. longae, virides, mox deciduae. *Cymae* terminales; bractae stipulis similes nisi paululo maiores et obtusiores; pedicelli masculi 3–5 mm. longi. *Perianthium* masculum e segmentis 4 ellipticis vel obovato-ellipticis obtusis dorso puniceo-suffusis intra puniceis constitutum, 1 cm. diametro. *Androphorum* bene evolutum, circa 1.5 mm. longum, antheris parvis obtriangularibus

apice truncatis luteis dorso pallide viridi-suffusis subsessilibus. *Perianthium* ♀ 5-merum, aliter ei ♂ simile. *Receptaculum* 4 mm. longum, alis inclusis apice 6 mm. latum, parce glanduloso-puberulum, subaequaliter 3-alatum, alis subtriangularibus bene infra ovarium oreuntibus supra ovarium vix productis. *Styli* 2, circa 1 mm. longi, fere ad medium inter se connati, stigmatibus semilunaribus haud tortis papillois; ovarium 1.75 mm. longum, 2-loculare, placentis simplicibus. *Fructus* fere maturus 6 mm. longus, apice alis inclusis 7 mm. latus, alis inter se inaequalibus, ala maiore 4 mm. longa, aliis circa 1.5 mm. longis.

Ranawng, Kao Pawta Chongdong, 700-900 m., mossy rocks in evergreen forest, *Kerr* 16757.

Except for ♀ flowers and fruit the description has been drawn up from a plant which flowered at Aberdeen in October of last year.

Begonia Rabilii *Craib* [Begoniaceae]; species quoad folia peltata *B. Hasskarlii* Zoll. et Mor. similis a qua foliis minoribus, inflorescentia bracteata, floribus masculis maioribus, antheris paucioribus brevioribus inter alia recedit.

Herba acaulis, glabra. *Folia* in speciminibus visis solitaria, ovata, apice obtusa, basi rotundata vel truncato-rotundata, 4-6.7 cm. longa, 3-5.2 cm. lata, chartacea, sicco pagina superiore viridia, squamis parvis rotundatis pallidis sparse instructa, subtus similiter squamosa vel saepissime punctata, pallidiora, nervis e basi radiantibus circa 10 supra subconspicuis vel fere obscuris subtus conspicuis, margine irregulariter crenulata et saepe paulo infra apicem utrinque plus minusve unilobulata, primo parce setulosa, petiolo 4-8 cm. longo 8-15 mm. supra laminae basem peltatim inserto suffulta. *Inflorescentia* solitaria, e basi oriens, pedunculo communi saepe paulo supra basem folium solitarium circa 0.5 cm. longum gerente, ramulis inferioribus ad 6.5 cm. longis basi ad 3.5 cm. nudis; bractee lineari-subulatae, 2 mm. longae, sub anthesin persistentes; pedicelli 8-10 mm. longi; alabastra ambitu ovata, apice obtusa, basi late emarginata vel truncato-emarginata. *Floris* ♂ perianthii partes 4; duae exteriores ambitu subellipticae, sicco 4 mm. longae, 2.75 mm. latae; duae interiores sicco 3.5 mm. longae, 1 mm. latae. *Androecium* 2.5 mm. altum; filamenta basi ad 0.75 mm. inter se in columnam connata, apice ad 0.5 mm. inter se libera; antherae circa 10, ambitu rotundato-ellipticae, apice emarginatae, 0.75 mm. longae, longitudinaliter dehiscentes, connectivo haud producto. *Floris* ♀ perianthium ei ♂ simile. *Receptaculum* inaequaliter 3-alatum, supra ovarium productum, 6 mm. longum, alis inclusis 7 mm. latum, alis membranaceis viridibus, maiore 5 mm. longa. *Styli* tres, 1.25 mm. longi; stigmata semilunaria, haud spiralter torta, papillosa; ovarium 2.25 mm. longum.

Tung Song, Kao Chem, on rock, *Rabil* 127.

Begonia rimarum *Craib* [Begoniaceae]; a *B. guttata* Wall. ex DC. et *B. debili* King fructus ala maiore magis angusta et elongata, a *B. socia* Craib foliis subtus glabris vel paucisetulosis recedit.

Herba tuberosa, inflorescentia inclusa ad 22 cm. alta; caulis inferne nudus vel saepissime squamis 1-3 alternis stipuliformibus instructus, flexuosus, 7-9 cm. altus, inferne radicans, glaber vel pilos perpaucos gerens. *Folia* caulinarum, alterna, duo vel interdum tria, inaequilateralia, latere altero dimidiatim ovata vel lanceolato-ovata, basi cordata, altero dimidiatim late ovata, basi alte cordata, 6.5-14.5 cm. longa, 3.5-9 cm. lata, membranacea, viva colore variabilia, viridia vel varie variegata (ex *Kerr*), supra setulas perpaucas gerentia, subtus glabra vel interdum etiam setulis perpaucis instructa, nervis e basi radiantibus 6-8 supra conspicuis subtus prominentibus saepissime furcatis cum ramulis ad marginem currentibus, margine subintegra, distanter setulosa, petiolo 1-11 cm. longo glabro vel pilis perpaucis instructo suffulta; stipulae persistentes, lanceolatae, acutae, ad 1 cm. longae, glabrae. *Inflorescentia* solitaria, terminalis vel etiam axillaris, glabra, pedunculo communi 6-14 cm. longo incluso 11-17 cm. longa, ramis paucis 5-8 cm. longis; bractae deciduae, stipulis similes nisi paulo minores; pedicelli 8-9 mm. longi. *Floris* ♂ perianthii partes 4; duae exteriores ellipticae, 7 mm. longae, 4.5 mm. latae, duae interiores oblongo-spatulatae, 6.5 mm. longae, 3 mm. latae. *Stamina* numerosa, filamentis inferne ad 1.5 mm. in columnam connatis, apice ad 0.75 mm. inter se liberis, antheris obtriangularibus connectivo haud producto. *Fructus* bilocularis, placentis bifidis, inaequaliter trialatus, ala maiore elongato-triangulari obtusa 1.3 cm. longa basi 8 mm. lata, alis minoribus triangularibus obtusis circa 3.5 mm. longis et basi 3.5 mm. latis.

Surat, Ban Nasan, 10 m., crevices of limestone rocks, *Kerr* 13327.

Begonia saxifragifolia *Craib* [Begoniaceae]; a *B. moulmeinense* C. B. Clarke foliis minoribus magis rotundatis recedit.

Herba tuberosa, caule haud evoluto vel ad 1.7 cm. longo gracili glabro, inflorescentia inclusa 5-10 cm. alta. *Folia* rotundata vel oblato-rotundata, aequilateralia, basi altius cordata, 0.7-3.5 cm. longa, 0.7-4 cm. lata, membranacea, sicco fusco-viridia vel saltem pagina inferiore rubra, glabra vel interdum pagina inferiore pilis elongatis sparsissime instructa, nervis e basi radiantibus 7 ramosis cum ramis ad marginem currentibus saepissime supra plus minusve conspicuis subtus prominulis, margine in foliis minoribus paucicrenulata, foliis maioribus lobatis, lobis ad 7 mm. longis et latis pauci-lobulatis sparse setosis, petiolo 5-20 mm. longo glabro vel pilis paucis elongatis instructo suffulta; stipulae parvae. *Inflorescentia* pauciflora, pedunculo communi ad 7.5 cm. longo gracili pilis paucis elongatis instructo suffulta; bractae parvae, deciduae; pedicelli 0.5-1.5 cm. longi, graciles, pilis paucis elongatis instructi; flores albi (ex *Kerr*). *Floris* ♂ perianthii partes 4; duae exteriores obovato-ellipticae, 4.5 mm. longae, 2.25 mm. latae, glabrae vel dorso basi pilis paucis elongatis instructae, duae interiores oblongo-spatulatae, 4.5 mm. longae, 1.75 mm. latae, glabrae. *Stamina* circa

20, filamentis basi ad 1 mm. in columnam inter se connatis superne interioribus inter se ad 0.5 mm. liberis, antheris obtriangularibus apice truncatis connectivo supra loculos vix producto. *Floris* ♀ perianthium ei ♂ simile nisi paulo minus. *Receptaculum* 3 mm. longum, alis inclusis 3 mm. latum, inaequaliter 3-alatum. *Ovarium* receptaculo paululo brevius; styli 3, inter se liberi, vix 1 mm. longi; stigmata papillosa, semilunaria, haud torta. *Capsula* 5 mm. longa, alis inclusis 8 mm. lata, inaequaliter trialata, ala maiore 4.5 mm. longa, alis minoribus circa 1 mm. longis.

Ranawng, Kao Talu, 50 m., damp limestone rock, *Kerr* 11804.

Begonia socia *Craib* [Begoniaceae]; a *B. guttata* Wall. ex A. DC. filamentis multo longioribus, a *B. integrifolia* Dalz. foliis minoribus integris, filamentis inferne in columnam longiorem connatis distinguenda.

Herba tuberosa, inflorescentia inclusa 5.5-15 cm. alta, caule erecto flexuoso parce piloso. *Folia* omnia caulinarum, 1-4, obliqua, apice obtusa vel obtuse subacuminata, latere altero dimidiatim lanceolata, basi cordata, altero dimidiatim late ovata, basi alte cordata, 5-14.5 cm. longa, 3-6.5 cm. lata, membranacea, sicco fusco-viridia, saepe subtus purpureo-suffusa, pagina superiore sparse setosa, inferiore ad nervos nervulosque sparse hirsuta, e basi 5-7-nervia, nervis lateralibus e costa ortis utrinque 3-5 omnibus supra plus minusve conspicuis subtus prominulis, integra, inferiora petiolo ad 8.5 cm. longo, superiora petiolo 4-10 mm. longo parce piloso suffulta; stipulae late lanceolatae, inaequilaterales, 5 mm. longae, parce piloso-ciliatae, membranaceae, persistentes. *Cymae* et axillares et terminales, pedunculo communi 2.5-7 cm. longo medio bibracteato incluso 4-12 cm. longae; bracteae deciduae, elliptico-obovatae vel subrotundatae, ad 8 mm. longae et 7 mm. latae, membranaceae, glabrae, integrae; pedicelli sub anthesin circa 12 mm. longi, glabri. *Floris* ♂ perianthium 4-merum; segmenta duo exteriora subelliptica, ad 9 mm. longa et fere 7 mm. lata, glabra, duo interiora oblongo-spatulata, 8 mm. longa, 4 mm. lata, glabra. *Stamina* numerosa, filamentis inferne ad 2.5 mm. in columnam inter se connatis apice ad 0.75 mm. liberis, antheris obtriangularibus circa 0.75 mm. longis, connectivo haud producto. *Perianthium* fl. ♀ ei masculi subsimile sed parum minus et 5-6-merum. *Receptaculum* inaequaliter trialatum, 7 mm. longum, alis inclusis 8 mm. latum, ala maiore receptaculo aequalta 3.5 mm. longa, alis minoribus etiam receptaculo aequilongis sed brevibus. *Styli* 2, circa 1.5 mm. longi, fere e basi liberi, stigmatibus papillosis spiraliter tortis; ovarium 2-loculare, placentis bilamellatis. *Capsula* 1 cm. longa, alis inclusis 1.8 cm. lata, inaequaliter trialata, ala maiore capsulae aequalta, 8 mm. longa, alis minoribus etiam capsulae aequaltis apicem versus circa 4 mm. longis.

Pa Tup, watershed between Mê Tak Mê Wang and Mê Na Hua, Mê Ing, 650 m., *Garrett* 196.

Begonia soluta Craib [Begoniaceae]; species habitu *B. Putii* Craib similis sed floribus maioribus, staminibus magis numerosis, receptaculo glabro, stylis inter se liberis differt.

Herba acaulis. *Folia* subrotundata oblatae, apice rotundata, basi altius cordata, 2-4 cm. longa, 2.5-5 cm. lata, subcarnosa, pagina superiore pilis brevibus sat copiose instructa, inferiore ad nervos pallide ferrugineo-pilosa, aliter glabra vel pilis brevibus instructa, nervis e basi radiantibus circa 9 supra conspicuis subtus prominentibus ad marginem currentibus, margine irregulariter denticulata, petiolo 2.5-8 cm. longo praesertim apicem versus pallide ferrugineo-piloso suffulta. *Flos* ♂ pedicello 10-25 mm. longo subsparse ferrugineo-piloso suffultus; bractae 5 mm. longae, fimbriatae. *Perianthium* 4-merum; segmenta duo exteriora obovata, apice rotundata, 11-15 mm. longa, 9-12 mm. lata, dorso pilis elongatis plus minusve sparsis instructa; duo interiora oblanceolata vel lineari-oblanceolata, 7-12 mm. longa, circa 2 mm. lata, glabra. *Stamina* numerosa, filamentis basi inter se ad 1 mm. in columnam connatis apice usque ad 1 mm. inter se liberis, antheris circa 0.75 mm. longis, connectivo parum truncato-producto. *Floris* ♀ perianthium ei ♂ simile sed paulo minus et saepissime e partibus 5 constitutum. *Receptaculum* circa 6 mm. longum, 3-alatum, alis ad basem currentibus, maiore fere 3 mm. longa. *Styli* 3, e basi omnino liberi, 1-2 mm. longi, stigmatibus semilunaribus haud tortis.

Kampêngpet, Kao Hua Mot, 900 m., crevices of limestone rocks, flowers pale pink, *Kerr* 6129.

Begonia subviridis Craib [Begoniaceae]; a *B. Smithiae* Geddes, cui maxime affinis, indumento minus denso, foliis vivis supra viridibus haud fusco-viridibus et haud arcte regulariterque bullatis, floribus subpuniceis recedit.

Herba perennis, ad 45 cm. alta, rhizomate crasso caules plures erectos emittente; caules rubri vel subvirides, basi ad 1.5 cm. diametro, pilis divergentibus rubris subdense instructi. *Folia* caulinarum, obliqua, apice acuminata, basi auriculata, auriculis parum imbricatis, latere altero late ovata, basi auriculata, altero lanceolato-ovata vel ovata, basi auriculato-cordata, circa 21 cm. longa et 16 cm. lata, sat rigida, supra viridia, subtus parum punicea, pagina superiore albo-setulosa, inferiore ad nervos rubro-pilosa, ad nervulos similiter sed brevius pilosa, nervis e basi radiantibus 9-10 supra conspicuis subtus prominentibus furcatis cum ramulis ad marginem currentibus, nervulis supra parum impressis subtus magis numerosis reticulationem prominentem efficientibus, margine ciliata, denticulata, dentibus saepe reflexis, interdum pauci-lobulata, petiolo ad 23 cm. longo basi 1 cm. diametro submolliter brevius rubro-piloso suffulta; stipulae circa 1 cm. longae et 2 cm. latae. *Cymae* et axillares et terminales, pedunculo communi ad 9 cm. longo incluso ad 15 cm. longae, circa 10 cm. diametro, pedunculis partialibus circa 3 cm. longis, ultimis circa 1.5 cm. longis, omnibus pilis rubris saepissime glanduloso-capitatis conspicue vel rarius sparse

instructis ; pedicelli usque ad 2 cm. longi, pallidiores, pilis similibus sed brevioribus et sparsioribus instructi ; bracteae deciduae, ovato-lanceolatae, circa 13 mm. longae, subpectinato-ciliatae, dorso pilis paucis instructae ; flores subpuniciei. *Perianthium* floris masc. 4-merum ; segmenta duo exteriora late ovata vel oblongo-ovata, obtusa, 2.5 cm. longa, 2 cm. lata, intra glabra, dorso pilis rubris sat validis sparse instructa, duo interiora oblongo-spatulata, apice rotundata, 1.7 cm. longa, 9 mm. lata, glabra. *Androecium* luteum, circa 7 mm. diametro et 6 mm. altum ; stamina numerosa, filamentis inter se liberis, antheris apice truncatis vel parum retusis. *Perianthium* fl. fem. ei masc. simile sed 5-merum. *Receptaculum* glabrum vel saepius pilis glanduloso-capitatis sparsissime instructum, 1 cm. longum, inaequaliter dilatatum, alis omnibus 1 cm. altis supra et infra ovarium parum productis, longiore 1.2 cm. longa obtusa latere superiore recta vel parum concava, brevioribus circa 4 mm. longis. *Ovarium* triloculare, placentis bi-ammellatis ; styli 3, bilobati, stigmatibus spiraliter tortis.

Described from a plant cultivated at Aberdeen from seed collected by Dr. Kerr on Kao Luang in Nakawn Sritamarat.

Begonia vagans Craib [Begoniaceae] ; species foliis lanceolatis vel deltoideis glabris apice radicanibus, alabastris pilosis, floribus inter minores distincta.

Herba tuberosa, foliis apice radicanibus vagans ; caulis tenuis, ad 5.5 cm. longus, glaber. *Folia* lanceolata, deltoideo-lanceolata, vel deltoidea, apice saepe acuminata, basi saepissime subaequaliter cordata, 4-15 cm. longa, 3-8 cm. lata, membranacea, sicco viridia, glabra, e basi 7-nervia, nervis lateralibus e costa ortis utrinque saepissime 2-3, omnibus supra plus minusve conspicuis subtus prominulis, nervulis vix conspicuis, margine irregulariter denticulata, interdum etiam lobulata, inferiora petiolo ad 5 cm. longo glabro suffulta, superiora breviter petiolata vel subsessilia ; stipulae lanceolatae, ad 6 mm. longae, glabrae, denticulatae. *Inflorescentia* et axillaris et terminalis, gracilis, pedunculo communi incluso ad 12 cm. longa, ramulis lateralibus circa 2 cm. longis, et rhachi et ramulis pilis transverse septatis glanduloso-capitatis subsparse instructis ; pedicelli 3 mm. longi, glabri ; bracteae deciduae. *Floris* ♂ perianthii partes 4 ; duae exteriores subrotundatae, circa 3.5 mm. diametro dorso pilis crassis instructae ; duae interiores circa 1.5 mm. longae et 0.75 mm. latae, glabrae. *Stamina* circa 15, filamentis inferne in columnam circa 1 mm. longam connatis apice brevissime liberis, antheris circa 0.5 mm. longis, connectivo haud producto. *Capsula* viridis, 8 mm. longa, alis inclusis 1.5 cm. diametro, alis inter se subaequalibus 6 mm. longis basi 8 mm. latis tenuibus horizontaliter nervosis.

Kanburi, Sai Yok, *Put* 1777.

Peucedanum siamicum Craib [Umbelliferae-Peucedaneae] ; species foliis pinnatis, pinnis trisectis vel trilobatis, segmentis vel lobis ultimis rotundatis vel obovatis distincta.

Caules setulis brevibus saepissime reflexis sparse instructi, sicco pallide brunnei, longitudinaliter sulcati. *Folia* inferiora bipinnata, petiolo 16–20 cm. longo incluso 27–30 cm. longa, petiolo basi vaginante indumento ei caulis simili instructo; pinnae trisectae vel varie trilobatae, segmentis ultimis rotundatis vel obovatis apice rotundatis vel obtusis ad 5.5 cm. longis et 5 cm. latis subcoriaceis supra ad costam nervosque dense breviter setulosis subtus ad costam nervosque setulosis aliter sparse setulosis nervis lateralibus utrinque 3–4 supra plus minusve conspicuis subtus cum costa prominentibus nervulis subtus paucis prominulis supra rete gracile impressum efficientibus margine crenatis vel serrato-crenatis; folia caulinarum parva, simplicia, trilobata vel trifoliolata, petiolo brevi vaginante suffulta, aliter basalibus similia. *Umbellae* compositae, et laterales et terminales, pedunculo circa 3–4 cm. longo suffultae; radii 12, circa 1.5–3 cm. longi, bracteis persistentibus lanceolatis saepe caudato-acuminatis circa 3 mm. longis; umbellae ultimae densae, pedicellis infructescentibus usque ad 3 mm. longis glabrescentibus. *Fructus* compressus, ellipticus, 6.5 mm. longus, ala inclusa 3.5 mm. latus, glaber.

Doi Chiengdao, *Put* 359.

Heracleum siamicum *Craib* [Umbelliferae-Peucedaneae]; ab affini *H. burmanico* Kurz foliis crassioribus indumento crassiore instructis, umbellis maioribus, receptaculo puberulo inter alia recedit.

Caules rigidi, ad 8 mm. diametro, longitudinaliter sulcati, pilis brevibus albis rigidis reflexis hirsuti. *Folia* basalia haud visa, superiora trisecta petiolo circa 1 cm. longo suffulta; segmenta lanceolato-oblonga, apice acuta, basi cuneata, ad 7 cm. longa et 2.7 cm. lata, sat rigida, sicco subtus pallidiora, supra ad costam nervosque laterales setulis paucis brevibus instructa, subtus ad costam nervos nervulosque breviter albo-setosa, nervis lateralibus utrinque circa 6 cum costa supra conspicuis vel parum impressis subtus prominentibus intra marginem furcatis cum ramulis ad marginem currentibus, margine crassius dentato-serrata et saepissime etiam lobulata. *Umbellae* compositae, et laterales et terminales, pedunculo communi cauli simile sub anthesin circa 5 cm. longo paululo post anthesin usque ad 15 cm. longo suffultae; radii 23, sub anthesin circa 2 cm., post anthesin ad 7 cm. longi, breviter hirsuti; bractee ad eorum bases cito deciduae, lineari-lanceolatae, acutae, circa 5 mm. longae; umbellulae primo congestae, vix 1 cm. diametro, mox ad 2.5 cm. diametro; pedicelli sub anthesin breves, paulo post anthesin usque ad 1 cm. longi, breviter hirsuti; bractee deciduae; flores haud radiant. *Receptaculum* puberulum. *Calycis* segmenta oblonga, obtusa, circa 0.5 mm. longa, puberula. *Petala* 2 mm. longa, apiculata, intra medio carinata, dorso puberula. *Filamenta* vix 2 mm. longa, antheris 1 mm. longis.

Doi Chiengdao, *Put* 342.

Schefflera cuneata *Craib* [Araliaceae-Hedereae]; inter species indochinenses foliis digitatis, fructu globoso distincta.

Frutex volubilis (ex Noe) ; ramuli primo stellato-furfuracei, mox glabri, cortice stramineo vel substramineo obtekti, lenticellis sparsis conspicuis. *Folia* digitata, petiolo 12–15 cm. longo striato glabro basi caulem amplectente suffulta ; stipulae deciduae ; foliola 7, oblongo-elliptica vel elliptica, apice obtuse acuminata vel subacuminata, basi cuneata vel late cuneata et saepe parum inaequilateralia, 7–13 cm. longa, 3–5.5 cm. lata, sicco olivacea vel fuscescentia, matura glabra, costa supra prominula subtus prominente, nervis lateralibus utrinque 6–8 supra subprominulis subtus prominulis intra marginem anastomosantibus, nervulis rete pagina utraque subprominulum efficientibus, margine integra, parum recurva ; petioluli inter se parum inaequales, 1.5–2.8 cm. longi. *Panicula* terminalis, usque ad 19 cm. longa et 16 cm. lata, ramis lateralibus usque ad 15 sed saepius paucioribus ramulos ultimos infructescentes circa 5 mm. longos circa 15 gerentibus ; pedicelli infructescentes circa 4 mm. longi, cum rhachi et ramulis stellato-furfuracei. *Receptaculum* breve. *Calyx* truncatus. *Petala* 6–7, lanceolato-deltaeidea, 2.25 mm. longa, 1.25 mm. lata. *Stamina* petalis isomera, filamentis 1.5 mm. longis, antheris circa 1 mm. longis. *Fructus* globosus vel depressoglobosus, ad 5.5 mm. diametro, 7–8-sulcatus, iugis obtusis, apice stigmatibus 7–8 sessilibus instructus, loculis 7–8.

Chantabun, Kao Petcha' Kut, 600 m., Noe 80.

Schefflera oblonga Craib [Araliaceae-Hedereae] ; a *S. singalangense* R. Viguier ovarii loculis paucioribus, a *S. petiolosa* Harms foliis integris inter alia recedit.

Folia digitata, petiolo 25–45 cm. longo glabro sicco primo subfusco mox stramineo striato suffulta ; foliola 8, saepissime oblonga ellipticave, rarius oblongo-lanceolata vel oblongo-oblancoolata, apice obtuse acuminata, basi cuneata vel late cuneata, 15–25 cm. longa, 5.5–11.8 cm. lata, chartacea vel rigide chartacea, sicco plus minusve olivacea vel fusca, pagina superiore glabra, inferiore praesertim apud costam pilis paucis brevibus stellatis instructa vel interdum fere glabra, costa supra prominula subtus prominente, nervis lateralibus utrinque 8–10 intra marginem anastomosantibus supra conspicuis vel fere subprominulis subtus prominentibus, nervulis rete gracile supra conspicuum subtus prominulum efficientibus, margine integra, parum recurva, petiolulo 2.5–9.5 cm. longo petiolis simili suffulta. *Umbellae* racemosim dispositae ; racemi pedunculo communi 6–8 cm. longo incluso 22–26 cm. longi, rhachi cum pedunculo pilis brevibus stellatis squamiformibus pallidis instructa ; umbellarum pedunculus sub fructu 10–14 mm. longus, indumento simili instructus ; pedicelli infructescentes circa 5 mm. longi, glabrescentes. *Fructus* ambitu oblongus vel late oblongus, circa 6 mm. longus et 4–5 mm. latus, longitudinaliter altius 5-sulcatus.

Chantabun, Kao Sabap, Put 897.

Schefflera simulans Craib [Araliaceae-Hedereae] ; a *S. affine* Ridl., cui facie similis, styliorum columna conspicua recedit.

Frutex epiphyticus (ex *Kerr*) ; ramuli primo fusci, mox cortice stramineo obtecti, glabri, lenticellis conspicuis. *Folia* digitata, petiolo 6·5–9 cm. longo striato suffulta ; stipulae inter se connatae, circa 1 cm. longae ; foliola 5–7, saepissime oblongo-oblongeolata, acute acuminata, basi cuneata et saepe parum inaequilateralia, 7–11 cm. longa, 2–3·7 cm. lata, rigide chartacea vel fere subcoriacea, sicco olivacea vel fusco-olivacea, matura glabra, costa supra subprominente subtus prominente, nervis lateralibus utrinque 7–9 intra marginem anastomosantibus supra argute subprominulis subtus prominulis, margine integra, recurva ; petioluli inter se inaequales, 1·5–3·5 cm. longi. *Panicula* terminalis, circa 10 cm. longa, 15–20 cm. diametro, sessilis, parce stellato-furfuracea, mox glabra, ramis tribus ramulos ultimos 5–7 ad 2 cm. longos saepissime oppositos gerentibus ; umbellae circa 10-florae ; pedicelli ad 8 mm. longi ; bractee deciduae. *Receptaculum* 1·75 mm. longum, sulcatum. *Calyx* brevis, undulatus. *Petala* 6–7, elongato-deltaeidea, 3 mm. longa, 2 mm. lata. *Stamina* petalis isomera, filamentis fere 5 mm. longis superne angustatis, antheris 2 mm. longis ad 1·25 mm. latis. *Styli* in columnam fere 1 mm. longam connati ; ovarium 6–7-loculare.

Nakawn Sritamarat, Kao Luang, 1600 m., evergreen forest, *Kerr* 15514.

***Brassaiopsis calcarea* Craib** [Araliaceae-Hedereae] ; a *B. aculeata* Seem. ramulis aculeis brevibus sed validis densius instructis recedit.

Arbuscula circa 5 m. alta (ex *Kerr*) ; ramuli annotini ad 1·5 cm. diametro, glabri vel saepissime pilis stellatis squamiformibus sparse instructi, stramineo-corticati, aculeis validis saepissime rectis ad 8 mm. longis sat dense armati. *Folia* sub anthesin haud evoluta. *Inflorescentia* terminalis, interdum ex umbella solitaria pedunculo communi 10 cm. longo bracteato constituta, saepissime ramulis lateralibus e bractearum axillis evolutis ex umbellis racemosim dispositis constituta, ad 15 cm. longa et 20 cm. diametro, ramis lateralibus bracteis umbellam solitariam terminalem gerentibus, probabiliter interdum bracteis his fertilibus e panicula constituta, primo pilis pallidis stellatis densius tecta ; bractee duriusculae, sub anthesin persistentes, plus minusve ovatae, iis rhachidis ad 1 cm. longis, ramulorum superioribus 3–5 mm. longis ; pedicelli ad 7 mm. longi, pallide tomentelli, basi bracteis oblongis circa 1·5 mm. longis et 1 mm. latis et bracteolis subulatis paulo longioribus instructi. *Receptaculum* 1·5 mm. longum, pallide tomentellum. *Calycis* segmenta circa 0·75 mm. longa, angusta vel interdum lanceolata, decidua. *Petala* 5, oblongo-ovata vel oblongo-lanceolata, 3·5 mm. longa, 1·75 mm. lata, ante anthesin dorso superne pallide tomentella. *Stamina* 5, filamentis glabris superne angustatis 3·5 mm. longis, antheris versatilibus ambitu oblongis 1·75 mm. longis. *Discus* conicus, 2 mm. altus. *Ovarium* inferum, 2-loculare, loculis uniovulatis ; styli inter se connati, 0·75 mm. longi.

Kanburi, Wangka, 200 m., limestone rocks, *Kerr* 10456.

Arthrophyllum ferrugineum Craib [Araliaceae-Hedereae]; ab *A. ovalifolio* Miq., cui probabiliter maxime affinis, inflorescentiae indumento ferrugineo inter alia distinguendum.

Arbor circa 10 m. alta (ex *Kerr*); ramuli iuventute evidenter densius ferrugineo-tomentelli, mox parce ferrugineo-furfuracei, striati, straminei vel fusco-straminei, circa 6 mm. diametro. *Folia* inferiora pinnata, petiolo 13–30 cm. longo incluso 56–150 cm. longa, petiolo cum rhachi terete striatulo mox parce ferrugineo-furfuraceo demum glabro; foliola utrinque 11–16, opposita, oblongo-lanceolata oblongave, apice obtuse acuminata, basi inaequilateralia, latere altero cuneata lateve cuneata, altero rotundata truncatave, interdum cordata, usque ad 16 cm. longa et 5.5 cm. lata, chartacea vel rigide chartacea, sicco subviridia vel plus minusve fuscescentia, saepe subtus brunnescentia, matura supra glabra, subtus parce breviter ferrugineo-furfuracea, vel fere glabra, costa supra conspicua vel saepe prominula subtus prominente, nervis lateralibus utrinque circa 7 paucis aliis tantum paulo minus validis interiectis supra conspicuis saepe parum impressis subtus prominentibus, nervulis paucis supra saepe parum impressis subtus subprominulis, margine integra, parum recurva, petiolulo ad 7 mm. longo suffulta; folia apud inflorescentiam unifoliolata, saepe subopposita, subelliptica, circa 4 cm. longa et 2.3 cm. lata, petiolo ad 1 cm. longo suffulta. *Inflorescentiae* ramuli 10–11, saepissime ad apices ramulorum subumbellatim dispositi, 6–24 cm. longi, breviores folia 2–3 parva vel squamiformia et umbellam gerentes, longiores folia unifoliolata pauca supra delineata, saepe umbellas paucas laterales, et apice umbellas 6–11 umbellatim dispositas pedunculo communi 1–3 cm. longo medio bibracteato suffultas gerentes; pedicelli subglabri, paululo post anthesin circa 1 cm. longi; bracteae parvae, cum pedunculo breviter ferrugineo-tomentellae. *Receptaculum* breve, subglabrum. *Calyx* brevis, breviter denticulatus vel sublobulatus. *Petala* 5, deltoideo-oblonga, 2 mm. longa, 1.5 mm. lata, carnosa, glabra. *Stamina* 5, filamentis paululo ultra 1 mm. longis, antheris obtusis, loculis inter se basi liberis. *Discus* carnosus, sulcatus. *Ovarium* uniloculare.

Songkla, Ban Prakawp, 100 m., by stream in evergreen forest, *Kerr* 15858.

Arthrophyllum lucens Craib [Araliaceae-Hedereae]; ab *A. diversifolio* Blume foliolis supra nitidis, nervis lateralibus magis numerosis recedit.

Arbor circa 7 m. alta (ex *Kerr*); ramuli brunneo-straminei vel fusco-straminei, striati, glabri, lenticellis parvis sparsis. *Folia* inferiora pinnata, petiolo 10–16 cm. longo cum rhachi striato brunneo vel fusco-stramineo suffulta; foliola utrinque 5, oblongo-lanceolata vel oblongo-ovata, basi inaequilateralia, rotundata vel latere altero rotundata, altero cuneata, usque ad 13 cm. longa et 4.8 cm. lata, chartacea vel rigide chartacea, matura glabra, supra sicco fusca, nitida, subtus brunnea vel brunneo-viridia, costa supra

prominula subtus prominente, nervis lateralibus utrinque 10-12 supra conspicuis haud rarius prominulis subtus prominentibus, nervulis rete laxum subtus subconspicuum supra subprominulum interdum parum impressum efficientibus, margine integra, anguste cartilaginea, recurva, petiolulo circa 5 mm. longo suffulta; folia apud inflorescentiam e foliolis paucioribus similiter constituta vel saepe unifoliolata, foliolis iis supra delineatis similibus. *Umbellae* fructuum ramulis per 9-10 ad apices ramulorum subumbellatim dispositis ad 10 cm. longis medio folia dua unifoliolata gerentibus gestae, pedunculis usque ad 3 cm. longis suffultae. *Fructus* oblique subellipsoideus, 7 mm. longus, 6 mm. diametro, disco et stylis persistentibus apice coronatus.

Songkla, Saba Yoi, under 50 m., scrub, *Kerr* 14801.

Arthrophyllum meliifolium *Craib* [Araliaceae-Hedereae]; ab *A. diversifolio* Blume foliolis crassioribus basi rotundatis, nervis lateralibus magis numerosis inferioribus haud obliquis, pedunculis pedicellisque magis robustis, floribus maioribus, ab *A. ovalifolio* Miq. nervis lateralibus magis numerosis minus conspicuis, receptaculo haud glabro recedit.

Arbor circa 4 m. alta, caule infra inflorescentiam simplice (ex *Kerr*). *Folia* inferiora pinnata, petiolo ad 15 cm. longo incluso ad 58 cm. longa, petiolo cum rhachi striato stramineo vel fusco-stramineo glabro; foliola utrinque 5-7, opposita, oblonga vel ovato-oblonga, basi parum inaequilateralia, rotundata, ad 14 cm. longa et 6 cm. lata, rigide chartacea, sicco supra saepissime subolivacea, subtus pallide viridia vel parum lutescentia, matura glabra, costa supra subprominente subtus prominente, nervis lateralibus utrinque circa 10 paucis aliis tantum paulo minus validis additis pagina utraque prominulis, nervulis pagina utraque plus minusve conspicuis sed vix reticulatis, margine integra, anguste cartilaginea et recurva, petiolulo ad 8 mm. longo suffulta; folia apud inflorescentiam inferiora pinnata foliolis paucioribus vel unifoliolata, suprema unifoliolata, foliolis iis supra delineatis similibus nisi paulo minoribus. *Inflorescentiae* ramuli umbellas gerentes solitarii, simplices vel pauciramosi, ex axillis inferioribus orti et ad rami apicem per 13-15 subumbellatim dispositi, 4-7 cm. longi, glabrescentes, paululo supra medium bibracteati; pedicelli glabrescentes, circa 7 mm. longi; bracteae ad pedicelli bases parvae, deciduae. *Receptaculum* 2 mm. longum, pallide ferrugineo-furfuraceum. *Calyx* brevis, undulatus vel sublobulatus. *Petala* 5, oblongo-deltaidea, 3 mm. longa, 2 mm. lata, sat crassa, intra medio superne carinata. *Stamina* 5, filamentis 2.5 mm. longis, antheris ante anthesin incurvis. *Discus* crassus. *Ovarium* uniloculare.

Sichon, under 50 m., sandy ground, *Kerr* 15668.

Trevesia tomentella *Craib* [Araliaceae-Panaceae]; a *T. palmata* Vis. alabastris obtuse acuminatis ferrugineo-tomentellis recedit.

Frutex circa 2 m. altus (ex *Kerr*), armatus. *Folia* alterna, palmatim lobata, ad 46 cm. longa, lobis 7-9 plus minusve lanceolatis vel oblanceolatis basem versus parum angustatis usque ad 35 cm. longis et 10 cm. latis, iuventute ferrugineo-tomentella, matura supra glabra, subtus parce ferrugineo-furfuracea, nervis primariis pagina utraque prominentibus, nervis lateralibus utrinque circa 10 pagina utraque minus prominentibus, nervulis paucis plus minusve conspicuis, margine serrata, petiolo ad 40 cm. longo iuventute ferrugineo-tomentello maturo valido striato praesertim inferne aculeis brevibus copiose armato suffulta; stipulae circa 2 cm. longae. *Umbellae* racemosim dispositae, pedunculo ad 15 cm. longo suffultae; bractee parvae; pedicelli usque ad 1.5 cm. longi, primo dense ferrugineo-tomentelli, demum plus minusve glabrescentes; alabastra etiam ferrugineo-tomentella. *Receptaculum* circa 2.5 mm. longum. *Calycis* tubus circa 1.5 mm. longus, lobi irregulares, saepissime lanceolati vel deltoidei, ad 1.5 mm. longi. *Petala* 7-8, carnosae, valvata, ante anthesin 5 mm. longa. *Stamina* 7-8, filamentis brevibus, antheris oblongis 2 mm. longis, loculis inter se parum inaequalibus apice basique inter se liberis. *Styli* in columnam brevem robustam omnino connati; ovarii loculi petalis isomeri.

Puket, Katu, 50 m., evergreen forest, *Kerr* 17470.

Trevesia valida *Craib* [Araliaceae-Panaceae]; columna stylare breve robusta a *T. palmata* Vis. diversa et cum *T. cheiranthia* O. Kze. congruens, ab hac foliorum lobis haud pseudopetiolutis inter alia recedit.

Arbor ad 4 m. alta, caule simplice (ex *Kerr*) armato iuventute ferrugineo-tomentello. *Folia* alterna, palmatim lobata, ad 32 cm. longa, lobis 9 late oblanceolatis apice angustatis basem versus paulo angustatis ad 21 cm. longis medio circa 8 cm. basi circa 3 cm. latis, iuventute ferrugineo-tomentella, matura supra glabra vel subglabra, subtus parce breviter ferrugineo-furfuracea, pallide brunnea, nervis primariis pagina utraque prominentibus, nervis lateralibus utrinque circa 8 pagina utraque prominulis, nervulis paucis plus minusve conspicuis, margine crenato-serrata, petiolo ad 65 cm. longo primo ferrugineo-tomentello maturo glabro subvalido striato inferne parce breviter aculeato suffulta; stipulae ad 2.5 cm. longae. *Inflorescentia* ad 70 cm. longa (ex *Kerr*), umbellis pedunculo usque ad 15 cm. longo suffultis; bractee parvae; pedicelli circa 1 cm. longi, ferrugineo-tomentelli; alabastra obtuse acuminata vel subacuminata, primo ferrugineo-tomentella. *Receptaculum* circa 2.5 mm. longum. *Calyx* brevis, truncatus vel subdenticulatus, ciliolatus. *Petala* 7. *Stamina* 7, antherarum loculis inter se parum inaequalibus et apice et basi inter se liberis. *Columna* stylaris robusta; ovarii loculi 6-7.

Banang Sta, 100 m., evergreen forest, *Kerr* 7335.

Scheffleropsis subintegra *Craib* [Araliaceae-Plerandreae]; species foliolis integris vel subintegris, staminibus ovariique loculis magis numerosis distinguenda.

Arbuscula circa 7 m. alta (ex *Kerr*) ; ramuli primo pilis stellatis squamiformibus tecti, demum glabri, cortice stramineo obtecti, lenticellis vix conspicuis rotundatis. *Folia* alterna, digitata, petiolo 16–23 cm. longo striato furfuraceo suffulta ; stipulae inter se connatae, inferne petiolo adnatae, superne liberae, circa 1.5 cm. longae, dorso furfuraceae, margine primo ciliatae ; foliola 8–9, oblongo-obovata, apice breviter obtuse cuspidato-acuminata, basi cuneata, interdum parum inaequalateralia, 7.5–14 cm. longa, 3.5–6.7 cm. lata, subcoriaceo-chartacea, sicco brunnescentia vel fuscescentia, matura glabra, nervis lateralibus utrinque 7–9, paucis aliis tantum paulo minus conspicuis interiectis, intra marginem anastomosantibus pagina utraque plus minusve conspicuis, nervulis vix conspicuis, margine integra vel obsolete denticulata, parum recurva, petiolulo 2.5–6 cm. longo glabro supra apice et basi canaliculato medio anguste argute canaliculato suffulta. *Inflorescentia* apices versus ramulorum evoluta, e racemis paucis umbellas gerentibus constituta ; racemi, pedunculo communi 8.5–11 cm. longo incluso, 17–21 cm. longi, umbellas saepissime 5 gerentes ; umbellarum pedunculi communes 2–3.7 cm. longi ; pedicelli 1 cm. longi, haud articulati ; bractae deciduae ; pedunculi et pedicelli pilis paucis parvis stellatis instructi vel subglabri ; alabastra ambitu obovata vel quadrato-obovata, ad 8 mm. longa, glabra. *Receptaculum* ad 3 mm. longum, apice usque ad 7 mm. diametro. *Calyx* truncatus, tubo circa 0.25 mm. longo. *Corolla* ut videtur calyptratim decidua. *Stamina* 20, filamentis 2.25 mm. longis, antheris oblongis 3.25 mm. longis, loculis inter se parum inaequalibus apice et basi inter se liberis. *Styli* in columnam validam 2 mm. longam longitudinaliter sulcatam apice concavam omnino connati ; ovarii loculi 15, loculo quoque uniovulato.

Trang, Kao Sung, 800 m., evergreen forest, *Kerr* 15231.

Alangium oblongum *Craib* [Alangiaceae] ; ab *A. ebenaceo* Griff. ex C. B. Clarke foliis tenuioribus, nervis lateralibus paucioribus inter alia recedit.

Arbor circa 30 m. alta (ex *Kerr*) ; ramuli iuventute breviter adpresse furfuracei, sicco fusci, cito glabri, cortice pallide brunneo vel cinereo obtecti, lenticellis parvis prominulis haud numerosis. *Folia* alterna, saepissime oblonga vel suboblonga, apice obtuse acuminata vel subacuminata, haud rarius obtusa vel fere rotundata, basi cuneata, 8–18 cm. longa, 4–7 cm. lata, rigide chartacea, sicco viridia vel subolivacea, iuventute densius adpresse furfuracea, cito pagina utraque glabra, nervis lateralibus utrinque 8–10 cum costa supra prominulis subtus prominentibus, inferioribus sat obliquis, saltem superioribus intra marginem anastomosantibus, nervis transversis pagina utraque subprominulis, margine integra, parum recurva, petiolo 1–1.5 cm. longo primo densius adpresse furfuraceo cito glabro suffulta. *Cymae* axillares vel infra folia ortae, petiolo aequilongae vel eo dimidio longiores, fere e basi ramosae vel pedunculo communi ad 1 cm. longo suffultae, pedunculo cum ramulis sicco

fusco breviter sparse furfuraceo, 2-5-florae; flores albi, fragrantissimi (ex *Kerr*); pedicelli 4-8 mm. longi, summo apice articulati; bracteae deciduae. *Receptaculum* 3 mm. longum, longitudinaliter corrugatum, dense griseo-puberulum. *Calycis* tubus 1 mm. longus, apice undulatus. *Petala* 6, linearia, acuta, 2 cm. longa, basi 2.5 mm. lata, valvata, dorso dense griseo-puberula, intra basi glabra, aliter adpresse puberula. *Stamina* 6, filamentis 8 mm. longis basi glabris dorso densius breviter adpresse pubescentibus intra apice dense pilosis, antheris 9 mm. longis glabris. *Discus* carnosus, 2 mm. altus, styli basem cingens. *Stylus* staminibus paulo brevior, basi teres, glaber, superne paulo sulcatus, puberulus; stigma clavatum, 4-sulcatum, iugis corrugatis; ovarium uniloculare.

Ranawng, Kampuan, 50 m., evergreen forest, *Kerr* 17028.

LVIII.—ON THE FLORA OF THE NEARER EAST: VIII.*
A CONTRIBUTION TO OUR KNOWLEDGE OF THE FLORA OF AZERBAIDJAN, N. PERSIA. B. GILLIAT-SMITH AND W. B. TURRILL: III.

COMPOSITAE (continued).

Centaurea albonitens *Turrill* sp. nov.; a *C. gigantea* Sch. Bip. foliis pagina utraque minute papilloso-asperulis, involucri phyllis appendice scariosa lanceolata in spinam brevior attenuata differt.

Herba erecta, leviter ramosa, caule 5-7 mm. diametro glabro vel fere glabro albo-nitente ramis monocephalitis. *Folia* integra, pagina utraque infra praecipue minute papilloso-asperula, pallide virentia, nervis prominente reticulatis, inferiora elliptico-lanceolata, lamina apice gradatim leviter attenuata acuta basi cuneata in petiolum decurrente 1.9 dm. longa 7 cm. lata, petiolo 5.5 cm. longo, albonitentia; caulina oblonga vel oblongo-repanda, circiter 1.3 dm. longa, 4-5 cm. lata, sessilia, saepe valde decurrentia, suprema breviora angustioraque. *Capitula* terminalia, 4.5 cm. longa (flosculis inclusis), 3 cm. diametro; involucri phylla pallide virentia, ovata, media usque ad 1.7 cm. longa (appendice exclusa), 1.3 cm. lata, appendice scariosa 1-1.2 cm. longa plus minusve pectinatim ciliata apice in spinam 1-2 mm. longam attenuata, intimis lanceolatis 3.7 cm. longis apice minute scariosis. *Floscula* lutea, 3.7 cm. longa, lobis linearibus 7-8 mm. longis. *Achenia* glabra; pappus 1.3 cm. longus, nitens.

Plain west of Tabriz, 23.6.29, No. 2568. Flowers citron-coloured.

The affinity of this interesting species seems quite clear. The *Flaviflorae* species of the *Cynaroideae* subsection of the section *Acrocentron* are not numerous. Of the 7 species described in Boissier's *Flora Orientalis* iii. 672-674 (1875) the nearest to our plant is undoubtedly *C. gigantea* Sch. Bip. ex. Boiss. l.c. 672. This is only known from "in apricis lapidosis ad pagum Gara Kurdistaniae prope Mossul (Ky. 349)," and two sheets of the type number are represented

*Continued from *K.B.* 1930, p. 398.

at Kew. The shining stems, and to a less extent leaves also, and the shorter apical spines to the phyllary appendages distinguish *C. albonitens* from *C. gigantea*. *C. regia* Boiss. and the more recently described *C. imperialis* Bornm. have rose-coloured florets.

C. depressa *M. Bieb.* Flor. Taur.-Cauc. ii. 346 (1808).

Valley of Livan, 9.25, florets blue with reddish purple corollatubes, No. 1287; near Tabriz, 5.26, No. 1513; cornfields near Tabriz, 5.26, No. 1577; cultivated at Kew from Tabriz seed, as K.659, 10.7.28. Flowers from mid-May onwards.

Distrib. Asia Minor, Armenia, Transcaucasus, Persia, Baluchistan, Afghanistan.

C. Glehnii *Trautv.* in Acta Hort. Petrop. iv. 382 (1876), var. **purpurea** *Trautv.* l.c.

Mishou Dagh, 12.7.28, No. 2422; 5.8.29, No. 2597.

Distrib. (of species and var.) Armenia.

C. iberica *Trev. ex Spreng.* Syst. iii. 406 (1826).

Around Tabriz, 8-9.25, flowers white or pink, No. 1297; near Tabriz, 5.27, No. 2045; cultivated at Kew from Tabriz seed as K.661, 3.10.28. Flowers naturally from mid-May throughout the summer.

Distrib. Balkan Peninsula and Orient.

C. moschata *L.* Sp. Pl. 909 (1753).

Between Marand and Djulfa, 20.5.28, cream flowers with rosy tinge, No. 2311; plain west of Tabriz, 23.6.29, No. 2566.

Distrib. Caucasus, Armenia, Persia, Turkestan, Baluchistan, Afghanistan.

C. pergamacea *DC.* Prodr. vi. 569 (1837).

Plain south-west of Urmia, 20.5.26, No. 1562.

Distrib. E. Asia Minor, Syria, Persia.

C. pulchella *Ledeb.* Ic. Plant. Alt. i. 22, t. 93 (1829).

Hills south of Tabriz, 14.6.27, flowers white or pink, No. 1851.

Distrib. Asia Minor, Armenia, Caucasus, Persia, Turkestan, Cent. Asia.

C. solstitialis *L.* Sp. Pl. 917 (1753).

Yam, 11.9.28, flowers yellow, No. 2455.

Distrib. Cent. Eur. and Medit. Region.

C. Urvillei *DC.* Prodr. vi. 592 (1837).

Sir, 27.5.28, flowers mauve, pink, or purple, No. 2309.

Distrib. Asia Minor, Armenia, W. Persia.

C. deinacantha Boiss. et Hausskn. in Boiss Flor. Or. iii. 665 (1875) is probably not distinct from this species.

C. virgata *Lam.* Dict. i. 670 (1785), var. **squarrosa** Boiss. Flor. Or. iii. 651 (1875).

Heights above Livan, 8-9.25, flowers pink or red, No. 1277 ; near Tabriz, 6.26, No. 1713 ; 6.26, No. 1764 (approaching the type, sensu Boissier) ; 4.6.27, No. 1950 ; Yam, under Mishou Dagħ, 7.8.27, No. 1998.

Distrib. (of species and var.) Orient, Cent. Asia.

Chamaemelum disciforme Vis. Flor. Dalm. ii. 85 (1847).

Weed in garden near Tabriz, 1.5.27, yellow disc, no rays, No. 1878. Flowers from the first half of May to July.

Distrib. E. Asia Minor, Armenia, Transcaucasus.

C. praecox Vis. Flor. Dalm. ii. 86 (1847).

Hills south of Tabriz, 5.5.26, white rays and yellow disc, No. 1478 ; near Tabriz, 5.27, No. 1941.

Distrib. Asia Minor, Syria, Iraq, Caucasus, N. Persia.

Chardinia orientalis Hayek in Ann. Hofmus. Wien. XX. 424 (1907). *C. xeranthemoides* Desf. Mém. Mus. Paris iii. 456, t. 21 (1817).

Hills south of Tabriz, 5.26, flowers pink, No. 1435 ; Mishou Dagħ, 22.5.27, No. 1792 ; hills south of Tabriz, 6.27, No. 1947.

Distrib. Asia Minor, Syria, Armenia, Iraq, Persia, Afghanistan, Turkestan.

Chartolepis lyrata Boiss. et Hausskn. in Flor. Or. iii. 696 (1875).

Yam, under Mishou Dagħ, 7.8.27, No. 1997. In flower from mid- or late July ; flowers bright yellow.

Distrib. Persia.

Chondrilla juncea L. Sp. Pl. 796 (1753).

Hills south of Tabriz, 7.8.27, flowers yellow, No. 2005. Also seen at Yam.

Distrib. E.N. Temp. Region.

Chrysanthemum coronarium L. Sp. Pl. 890 (1753).

Cultivated in a garden at Tabriz, 15.6.26, flowers yellow, No. 1754.

Distrib. Medit. Region.

C. Parthenium Bernh. Syst. Verz. Erf. 145 (1800).

Matricaria Parthenium L. Sp. Pl. 890 (1753).

Weed in garden, Tabriz, 5.6.26, white rays, No. 1704.

Distrib. Eur. and east to Caucasus.

C. sinensis Sab. in Trans. Linn. Soc. xiv. 145 (1825). var. *floribus omnibus ligulatis*.

Cult. in garden of British Consulate, Tabriz, 10.11.27, No. 2210.

Distrib. Cultivated in many parts of the world.

Cichorium Intybus L. Sp. Pl. 813 (1753), var. **glabratum** Gren. et Godr. Flor. Fr. ii. 286 (1850).

Weed in garden, Tabriz, 21.7.26, flowers blue, No. 1756.

Distrib. (of species) E.N. Temp. Region.

(of var.) very common in the south and east of the distributional range of the species.

Two specimens, collected as garden weeds, Tabriz, 14.6.27, No. 2047 and 6.28, No. 2420, belong to this species but have not been matched with any varietal descriptions. Their characters are: *Planta* tota plus minusve hispida. *Folia* caulina haud vel distincte lobata marginibus dentatis. *Inflorescentia* ramosa, capitulis et sessilibus et pedunculatis instructa.

Cirsium apiculatum DC. Prodr. vi. 642 (1837). *C. libanoticum* DC. l.c. 647 (1837).

Mishou Dagh, 7.28, No. 2461. Flowers pink to purple from July onwards.

Distrib. Syria, Persia.

C. arvense Scop. Flor. Carn. ed. 2, ii. 126 (1772), var. **incanum** Ledeb. Flor. Ross. ii. 735 (1846).

Near Tabriz, 12.7.28, flowers purple, No. 2425.

Distrib. (of species) E.N. Temp. Region.

(of var.) here and there in the species area.

C. echinus Hand.-Maz. in Ann. Hofmus. Wien xxiii. 197 (1909). *C. scleranthum* M. Bieb. Flor. Taur.-Cauc. 559 (1819).

Mishou Dagh, 8.28, No. 2421.

Distrib. N. Asia Minor, Armenia, Caucasus, N. Persia.

C. Haussknechtii Boiss. Flor. Or. iii. 535 (1875).

Summit of Mishou Dagh, 8.28, No. 2464; high up on Mishou Dagh, 2.9.29, flowers pink, No. 2632 (somewhat less cano-tomentose than usual).

Distrib. W. Persia.

C. rhizocephalum C. A. Mey. Verz. Pflanz. Cauc. 70 (1831).

Yam, 13.9.28, flowers pink, white, or mauve, No. 2460.

Distrib. Asia Minor east to Afghanistan.

C. strigosum Boiss. Flor. Or. iii. 536 (1875) var (?).

Dik Dash, 8.29, No. 2645.

Distrib. Caucasus.

The material available makes it difficult to decide with certainty on the status of the above plant. It has glabrous stems and one capitulum measuring 4 cm. long (including the florets) and the pericline 2 cm. in diameter.

C. Szovitsii Boiss. Flor. Or. iii. 527 (1875).

Between Yam and Seivan, 8.28, flowers pink, No. 2453; Yam and also east of Seivan, 8.28, No. 2463.

Distrib. Transcaucasus, Armenia, Azerbaidjan.

C. yamense Turrill in Kew. Bull. 1929, 228.

Yam, 7.8.27, No. 2001; 8.2.28, flowers pink, No. 2452.

Flowers in July and August and said to be the "kangar" of which the young underground shoots are eaten in the spring and called "artichoke" by the European colony.
Endemic.

C. yamense *Turrill*, var. **arachnoideum** *Turrill* l.c. 229.

Yam, 8.28, flowers pink, No. 2462; Mishou Dagh, 2.9.29, No. 2626.

Endemic.

Cnicus benedictus *L.* Sp. Pl. 826 (1753).

Hills south of Tabriz, 29.4.27, flowers yellow, No. 1876; cultivated at Kew from Tabriz seed, 50/27, 10.7.28. Flowers from end of April to July.

Distrib. Medit. Region.

Coreopsis Atkinsoniana *Dougl.* in Lindl. Bot. Reg. t. 1376 (1830).

Tabriz, cultivated in a garden, 6.26, No. 1759. Locally known as "Ashrafi."

Distrib. N. America.

Cousinia compacta *Turrill* in Kew Bull. 1929, 229.

Near Tabriz, 6.26, flowers pink or purple, No. 1755; 25.6.27, No. 1956.

Endemic.

C. cynaroides *C. A. Mey.* Verz. Pflanz. Cauc. 230 (1831).

Near Tabriz, 21.7.26, No. 1753; 25.6.27, No. 1955. Flowers white or cream-white, scented.

Distrib. Caucasus, Armenia, N. Persia.

C. grandis *C. A. Mey.* in DC. Prodr. vi. 557 (1836) var. **minor** *Bornm.* in Verh. Zool.-Bot. Ges. Wien lx. 139 (1910).

Dik Dash, Yam, 28.8.27, No. 2103; near Tabriz, 8.28, No. 2367.

Distrib. (of species and var.) Azerbaidjan.

C. Kotschyi *Boiss.* Diagn. Ser. I. vi. 120 (1845).

Hills south of Tabriz, 6.29, No. 2549.

Distrib. Persia.

C. microcephala *C. A. Mey.* ex DC. Prodr. vi. 552 (1837), var. **glabrescens** *Turrill* var. nov.

Folia caulina in pagina superiore glabra vel glabrescentia. *Capitula* elongato-ovoidea, 1.5 cm. longa (flosculis exceptis), 9 mm. diametro, involucri phyllis, laevisime araneosis.

Dik Dash, Yam, 8.29, flowers yellow, No. 2615.

Distrib. (of species) Azerbaidjan.

The affinity of this plant is not in doubt, though its exact status is uncertain from the material available. It is related to both *C. ramosissima* DC. and *C. microcephala* C. A. Mey. From the former it is distinguished by its larger capitula and from the latter (e descriptione) by the glabrous or almost glabrous upper surface of the cauline leaves and the only slightly araneose pericline.

C. tabrisiana Bunge Mem. Acad. Imp. Sci. Petersb. ix. No. 2.16 (1865).

Near Tabriz, 19.6.26, No. 1737; 26.6.27, No., 1957. Flowers yellow with red anthers.

Distrib. Azerbaidjan.

C. urmiensis Bornm. Verh. Zool.-Bot. Ges. Wien lx. 135 (1910).

Near Tabriz, 22.6.27, No. 1958.

Distrib. Azerbaidjan.

Crepis foetida L. Sp. Pl. 807 (1753), var. **rhoeadifolia** Boiss. Flor. Or. iii. 851 (1875).

Tabriz, 21.7.26, flowers yellow, No. 1760; 8.27, No. 1990.

Distrib. (of var.) Balkan Peninsula, Asia Minor, Syria, Caucasus, Crimea, N. Persia.

Crupina crupinastrum Vis. Flor. Dalm. ii. 42, t. 51, f. 3 (1847).

Near Tabriz, 26.5.26, flowers pink, No. 1596.

Distrib. Medit. Region.

C. vulgaris Cass. Dict. Sci. Nat. xii, 68 (1818).

Hills south of Tabriz, 5.6.27, flowers pink, No. 1949; cultivated at Kew from seeds collected near Tabriz, 29.6.28.

Distrib. Medit. Region and Cent. Asia.

Echinops descendens Hand.-Maz. in Ann. Nat. Hofmus. xxvii. 439 (1913).

Hills south of Tabriz, 2.6.27, flowers dirty white, No. 1952; 6.28, No. 2358.

Distrib. Military zone between Iraq and Syria.

This very interesting plant agrees well with the original description. It is a species of the section *Oligolepis* Bunge and is allied to *E. leucographis* Bunge, *E. Haussknechtii* Boiss., and *E. polygamus* Bunge. Handel-Mazzetti compares it with *E. Haussknechtii*, a species I have not seen, but it is probably most nearly related to *E. polygamus*. The following differential diagnosis has been prepared: species ab *E. leucographo* foliis pagina inferiore costa praecipue glandulis numerosioribus instructis, involucris squamis omnino glabris minus valde spinescentibus intimis basi in tubo et 5-angulatis et 5-sulcatis connatis differt; ab *E. polygamo* Bunge foliis pagina superiore indumento arachnoideo in nervis denso caeterum parco vel nullo haud aequabili penicillis longioribus recedit. The species is decidedly intermediate in the sum of its characters between *E. polygamus* and *E. leucographus*. Handel-Mazzetti collected the plant from "Brachacker am brackischen See El Chattunije zwischen dem mittleren Chabur und dem Dschebel Sindschar 14/VII. 1900 (nr. 1647). Steinige Steppe zwischen Gharra und Sfaijan am NW.—Fuss des Dschebel Abd el Asis." This area is now just beyond the north-western boundary of Iraq. The two species with which it is here compared are both Persian from between Ispahan and Teheran.

E. persicus *Stev. ex. Fisch. Cat. Hort. Gorenk. ed. 37 (1812) nomen nudum* ; Boiss. *Flor. Or. iii. 440 (1875)*.

Mishou Dagħ and fields at Yam, 8.9.29, inflorescence grey-blue to blue, stems always white, No. 2643.

Distrib. Caucasus, Afghanistan.

E. viscosus *DC. Prodr. vi. 525 (1837)*.

Dik Dash, Yam, 28.8.27, inflorescence sky-blue, stems brown, No. 2101 ; 8.29, No. 2614.

Distrib. Sicily, southern Balkan Peninsula, Asia Minor, Syria, Palestine, Armenia, N. Persia.

Erigeron orientalis *Boiss. Diagn. Ser. II. iii. 7 (1856)*.

Above Zindjanab, Sahand Range, 25-27.6.29, No. 2519 ; Mishou Dagħ, 9.29, No. 2623.

Distrib. E. Asia Minor, Armenia, Caucasus, N. Persia.

Gaillardia aristata *Pursh. Flor. Am. Sept. ii. 573 (1814) vars.*

Tabriz, cultivated in garden, 18.7.27, Nos. 1992, 1993. Locally known as "Zilf-afshān."

Distrib. N. America.

Garhadiolus Hedypnois *Jaub. et Spach Ill. iii. 119 t. 284 (1847-50)*.

Yam, weed in millet fields, 13.9.28, flowers pale yellow, No. 2458.

Distrib. Asia Minor, Syria, Iraq, Persia, Baluchistan, Caucasus, N. India.

Gundelia Tournefortii *L. Sp. Pl. 814 (1753)*.

Urmia district, 5.26, florets mauve, No. 1527 ; plain under Mt. Sir, Yam, and Dik Dash hill, 24.6.28, No. 2310.

Distrib. Asia Minor, Syria, Palestine, Iraq, Armenia, Persia.

Helichrysum arenarium *DC. Flor. Fr. iv. 132 (1805), var. stenophyllum Boiss. Flor. Or. iii. 235 (1857)*.

Gardens to the north-east of Tabriz, 6.27, generally yellow, No. 1933 ; hills south of Tabriz, 11.6.28, No. 2293 (specimen young and with just a tinge of pink in some of the phyllaries).

Distrib. (of species) Cent. Eur., Caucasus, N. Persia, Cent. Asia.
(of var.) Caucasus, Azerbaidjan.

H. armenium *DC. Prodr. vi. 183 (1837)*.

Yam, 8.27, No. 2009 ; Mishou Dagħ, 8.28, flowers yellow, No. 2423.

Distrib. E. Asia Minor, Iraq, Persia.

The long indumentum is less obvious and the minute sessile glands are more obvious in No. 2423 than in No. 2009.

H. Eichwaldii *Boiss. et Buhse Aufz. 121, t. vi., f. 3 (1860)*.

Near Tabriz, 6.7.26, flowers from ruby-red to every shade of pink verging to yellow, No. 1652 ; 6.26, No. 1735 ; gardens to the north-east of Tabriz, 6.27, No. 1934 ; near Tabriz, 11.6.27, Nos. 1935, 1936 ; hills south of Tabriz, 11.6.28, No. 2294 (young).

Distrib. Caucasus, N. Persia.

H. glandulosum Ledeb. Flor. Ross. ii. 605 (1846).

Mt. Sir, Urmia district, 27.5.28, flowers bright yellow, No. 2292.
Distrib. Caucasus, N. Persia.

The whole plant is very aromatic and glandular and after gathering it the hands smell, not unpleasantly, for the rest of the day, even after washing with soap.

Hieracium sabaudum L. Sp. Pl. 804 (1753) s.l. (det. A. R. Horwood).

Mishou Dagħ, 5.8.29, flowers yellow, No. 2595.

Distrib. Cent. and W. Eur. east to N. Persia.

Inula britannica L. Sp. Pl. 882 (1753).

Mishou Dagħ, 7.8.27, flowers yellow, No. 2000.

Distrib. E.N. Temp. Region.

I. oculus-Christi L. Sp. Pl. 881 (1753).

Mishou Dagħ, 12.7.28, flowers yellow, No. 2424 ; 5.8.29, No. 2591.

Distrib. Cent. Eur., Orient.

I. thapsoides DC. Prodr. V. 464 (1836), sensu Boiss. Flor. Or. iii. 190 (1875).

Mishou Dagħ, 7.8.27, flowers yellow, No. 1999.

Distrib. Asia Minor, Caucasus, N. Persia.

Jurinea leptoloba DC. Prodr. vi. 675 (1837).

Near Tabriz, 6.26, No. 1749 ; 18.6.27, No. 1948. Cultivated at Kew from Tabriz seed, as K. 661, 3.10.28. Flowers June and July, creamy white sometimes with a pink tinge.

Distrib. Azerbaidjan.

J. pulchella DC. Prodr. vi. 676 (1837).

Yam, 9.9.28, flowers pink-white, No. 2456.

Distrib. Azerbaidjan.

The species is local round Yam but does not occur near Tabriz, where its place is taken by *J. leptoloba*.

J. macrocephala DC. Prodr. vi. 674 (1837).

Hills south of Tabriz, 7.27, No. 1942. Flowers very strongly and sweetly scented, often pink but sometimes white.

Distrib. N. and W. Persia.

J. macrocephala DC., var. **glabrescens** Turvill var. nov. ; a planta *Aucher-Eloy* 3505 caulibus folisque glabrescentibus haud tomentosocanis foliis in marginibus et pagina inferiore praecipue-asperulis recedit. Floribus albis.

Hills south of Tabriz, 7.27, No. 1943.

Koelpinia linearis Pall. Reise iii. 755, t. Ll. fig. 2 (1776).

Near Tabriz, 14.5.27, flowers yellow, No. 1801 ; 6.27, No. 1879 ; weed in new garden south-east of Tabriz, 5.6.28, No. 2318.

Distrib. Medit. Region, east to Cent. Asia and N. India.

Lactuca orientalis Boiss. Flor. Or. iii. 819 (1875).

Valley of Livan, 9.25, flowers pale yellow, No. 1282; Yam, 7.8.27, No. 2002.

Distrib. Orient and Cent. Asia.

The species also occurs on the hills south of Tabriz and is often used to make brooms. Flowers normally in July and August.

L. Scariola L. Sp. Pl. ed. 2. 1119 (1764), var. **integrifolia** Bischoff Beitr. z. Fl. Deutschl. u. Schweiz 189 (1851).

Garden weed, near Tabriz, 7-8.27, flowers yellow, No. 2048; 8.27, Nos. 2110, 2152.

Distrib. (of species) E.N. Temp. Region.

(of var.) here and there with the species.

L. undulata Ledeb. Flor. Alt. iv. 156 (1833).

Near Tabriz, 25.6.26, flowers yellow, No. 1710.

Distrib. Armenia, Persia, Arabia, Turkestan, Cent. Asia, Baluchistan, N. India.

Leontodon asperimus Boiss. Flor. Or. iii. 730 (1875).

Hills south of Tabriz, 19.6.27, flowers yellow, No. 1939.

Distrib. Epirus, Thessaly, Asia Minor, Syria, Iraq, Caucasus, N. Persia, Turcomania.

L. hastilis L. Sp. Pl. ed./2. 1123 (1764).

Stream under Mishou Dagh, 8.29, flowers yellow, No. 2611.

Distrib. Eur. and Medit. Region.

Leucanthemum maximum DC. Prodr. vi. 46 (1837).

Tabriz, cultivated in gardens, 21.7.26, rays white, disc yellow, No. 1757.

Distrib. Pyrenees.

L. vulgare Lam. Flor. Fr. ii. 137 (1778).

Tabriz, cultivated in garden, 5.26, rays white, disc yellow, No. 1758.

Distrib. E.N. Temp. Region.

Microlonchus oligochaetus Boiss. Flor. Or. iii. 701 (1875).

Hills south of Tabriz, 6.26, No. 1750; 4.6.27, No. 1877. Also found near Urmia. Flowers from early July through the summer, pink and sometimes white. Prostrate in its desert form.

Distrib. Armenia, N. Persia.

Onopordon Acanthium L. Sp. Pl. 827 (1753).

Garden weed, Tabriz, 7.29, flowers purple, No. 2547; 8.29, No. 2644. Also found at Yam.

Distrib. E.N. Temp. Region.

O. heteracanthum C. A. Mey. Verz. Pfl. Cauc. 68 (1831).

Hills south of Tabriz, 7.26, flowers red or purple, No. 1774; 7.27, No. 1953.

Distrib. Transcaucasia, N. Persia.

Flowers purple, July and August.

O. heteracanthum C. A. Mey., var. **ortholepis** Bornm. in Bull. Herb. Boiss. Ser. 2, vii. 222 (1907).

Hills south of Tabriz, 7.27, No. 1954.

Distrib. (of var.) N. Persia.

The "variety" is probably a young stage of development only.

Phaeopappus leuzeoides Boiss. Diagn. Ser. I. vi. 124 (1845).

Yam, weed in an arable field left fallow, 24.6.28, No. 2345. Flowers yellow.

Distrib. Persia, Armenia.

P. leuzeoides Boiss., var. **Szovitsii** Boiss. Flor. Or. iii. 597 (1875).

Yam, weed in arable field left fallow, 24.6.28, flowers yellow, No. 2346.

Distrib. (of var.) Persia, Armenia.

Phagnalon Kotschyi Sch. Bip. ex Boiss. Flor. Or. iii. 221 (1875).

Mishou Dag, cracks in rocks, 5.8.29, No. 2596.

Distrib. Syria, Kurdistan.

Picnomon acarna Cass. Dict. Sci. Nat. xl. 188 (1826).

Dik Dash, Yam, 28.8.27, flowers pink, No. 2102; cultivated at Kew from Yam seeds, 14.8.28.

Distrib. Medit Region.

Picridium dichotomum Fisch. et Mey. in DC. Prodr. vii. 183 (1838).

Dik Dash, Yam, 21.8.27, flowers golden yellow, No. 2099; 8.28, No. 2457.

Distrib. Asia Minor, Armenia, Caucasus, Iraq, N. Persia.

Picris strigosa M. Bieb. Flor. Taur.-Cauc. ii. 250 (1808).

Dik Dash, Yam, 9.29, flowers yellow, No. 2625.

Distrib. Asia Minor, Syria, Iraq, Caucasus, Persia.

Pterotheca obovata Boiss. et Noë in Boiss. Diagn. Ser. II. iii. 98 (1856).

Near Tabriz, 5.26, Nos. 1491, 1616, 1687; 11.6.26, No. 1678; 24.6.26, No. 1697; 29.5.27, No. 2044. Cultivated at Kew from Tabriz seed as K.431. The yellow flowers close between 11 a.m. and noon for the rest of the day.

Distrib. S. Russia, E. Asia Minor, Caucasus, Armenia, Iraq, Persia, Baluchistan, Turkestan, Afghanistan.

For a note on the nomenclature of this species see *Kew Bull.* 1929, 229.

Pyrethrum Balsamita Willd., var. **tanacetoides** Boiss. Flor. Or. iii. 345 (1875).

Tabriz, weed in garden, 6.27, flowers yellow, No. 2108. Locally known as "Etr-Shāh," i.e. Attar of Kings, a name also given to other plants.

Distrib. (of species and var.) Armenia, E. Asia Minor, N. Persia.

Pyrethrum Gilliatii *Turrill* in Kew Bull. 1929, 228.

Hills to the south of Tabriz, 29.5.27, flowers yellow, No. 1937 ; 6.28, No. 2319. Earlier specimens of dwarfer habit, presumably from the same locality and received as Nos. 1688 and 1731, belong to this species. Flowers from end of May through June and July. Endemic.

Scorzonera armeniaca *Boiss.* Flor. Or. iii. 760 (1875).

Weed in gardens, Tabriz, 7.27, flowers yellow, No. 1880.

Distrib. Armenia, W. Persia.

S. cinerea *Boiss.* Diagn. Ser. I. xi. 44 (1849).

Mishou Dag, 5.8.29, flowers yellow, No. 2594 ; Dik Dash, Yam, 9.29, No. 2648.

Distrib. E. Asia Minor, Transcaucasus, N. Persia.

S. lanata *M. Bieb.* Flor. Taur.-Cauc. ii. 237 (1808).

Hills north of Tabriz, 24.4.29, flowers yellow, No. 2554.

Distrib. South Balkan Peninsula east to Persia.

S. papposa *DC.* Prodr. vii. 119 (1838).

Mishou Dag, 12.7.28, flowers yellow, No. 2426.

Distrib. Palestine, Syria, Iraq, Persia.

S. ramosissima *DC.* Prodr. vii. 125 (1838).

North-east of Saudj Bulaq, near Urmia, 20.5.26, flowers yellow, No. 1579.

Distrib. Persia.

Scorzonera sp. nov. ?

Mishou Dag, in tufts on the higher reaches, 19.7.28, flowers yellow, No. 2370.

The material is insufficient for description.

Senecio vernalis *W. et K.* Pl. rar. Hung. i. 23, t. 24 (1802).

Tabriz, garden weed, 1.4.26, flowers, No. 1345 ; 4.26, No. 1378 ; Yam, 8.27, No. 2010.

Distrib. Cent. Eur. and Medit. Region.

Serratula coriacea *Fisch. et Mey.* in DC. Prodr. vi. 668 (1737).

Dik Dash, Yam, on rocks, 21.8.27, No. 2100.

Distrib. Armenia, N. Persia.

The flowers are pink. The basal leaves turn black on drying. The plant is very tall and the stems almost leafless. It appears to grow exclusively in clefts of rocks with little or no earth visible.

Sonchus oleraceus *L.* Sp. Pl. 795 (1753).

Weed in garden near Tabriz, 5-6.26, flowers yellow, No. 1643 ; cultivated at Kew from Tabriz seed as K. 632, 3.8.27.

Distrib. Now practically cosmopolitan.

Tagetes erecta *L.* Sp. Pl. 887 (1753).

Tabriz, cultivated in a garden, 18.7.27, No. 1991.

Distrib. Mexico.

Taraxacum ceratophorum DC. Prodr. vii. 146 (1838).

North-east of Tabriz, 1927, flowers yellow, No. 1881.

Distrib. N. America, Cent. and N. Eur., Caucasus, Cent. Asia, N. China, but apparently new to Persia.

T. microcephalum Pomel Nouv. mat. 1. Flor. Atlantique 8 (1874) non Schur; Hand.-Mazz. Monogr. Taraxacum 18 (1907).

Stream under Mishou Dag, 8.9.29, flowers yellow, No. 2621.

Distrib. Asia Minor, Armenia, Syria, Persia, Afghanistan, Algeria, Morocco.

T. syriacum Boiss. Diagn. Ser. II. iii. 96 (1856).

Dik Dash, Yam, 2.8.28, flowers pale yellow, No. 2366.

Distrib. Palestine and Asia Minor east to Afghanistan and Turkestan.

T. Wallichii DC. Prodr. vii. 147 (1838).

Tabriz, garden weed, 4.27, flowers yellow, No. 2046; cultivated at Kew as K. 669, 19.8.29 and 6.9.29.

Distrib. Syria, Iraq, Transcaspia, Afghanistan, Turkestan, Mongolia, N. India, Tibet.

Thevenotia scabra Boiss. Flor. Or. iii. 455 (1875).

Yam, 9.28, flowers pink or purple, No. 2459. Also seen on the hills, south of Tabriz.

Distrib. N. Persia.

Tragopogon collinus DC. Prodr. vii. 115 (1838).

Urmia district, 20.5.26, flowers blue or pink, No. 1521.

Distrib. Armenia, Transcaucasus, Persia.

T. graminifolius DC. Prodr. vii. 114 (1838).

Weed in gardens near Tabriz, 9.25, flowers pale yellow, No. 1302; 4.26, No. 1401; 5.26, Nos. 1617, 1772; cultivated at Kew from Tabriz seeds as K.430, 18.6.28.

Distrib. Caucasus, N. Persia.

The N. Persian specimens recorded under this name are puzzling. In some of their characters, notably in the presence of some floccose indumentum immediately below the capitulum, they approach *T. persicus* Boiss. which is reduced in the Flor. Or. iii. 751 (1875) to β *stenophyllum* of *T. buphthalmoides* Boiss.

Xanthium spinosum L. Sp. Pl. 987 (1753).

Near Tabriz, garden weed, 8.27, No. 2150.

Distrib. Now nearly cosmopolitan.

Xeranthemum longepapposum Fisch. et Mey. in Nouv. Mém. Nat. Mosc. iv. 337 (1832).

Hills south of Tabriz, 29.6.29, flowers pink, No. 1692; 7.26, No. 1745. Flowers from the end of June.

Distrib. E. Asia Minor, N. Syria, Armenia, Persia.

X. squarrosus Boiss. Diagn. Ser. I. vi. 101 (1845), var. **unicolor** Boiss. Diagn. Ser. I. vi. 101 (1845).

Valley of Livan, 9.25, flowers pink or purple, No. 1279; near Tabriz, 7.26, No. 1746; 21.8.27, No. 2109; Dik Dash, Yam, 9.29, No. 2609; cultivated at Kew from Tabriz seed, 14.8.28. Flowers from June and for the rest of the season.

Distrib. (of species) Asia Minor, Iraq, Syria, Armenia, Caucasus, N. Persia.

(of var.) over much of the species area.

If Boissier [Flor. Or. iii. 445 (1875)] is correct in considering *X. Annettae* Kal. in Bull. Soc. Imp. Nat. Mosc. vii. 194 (1834) to be a *forma pygmaea* of this, the trivial *Annettae* has to be adopted for the species. From the description, and figure also, without seeing a type specimen or material from the original localities, I am not certain and prefer to retain the well authenticated name given by Boissier.

Zinnia elegans Jacq. Coll. (v) Suppl. 152 (1796).

Tabriz, cultivated, 8.7.27, No. 1995.

Distrib. Mexico.

CAMPANULACEAE.

Campanula Beauverdiana Forman in Mon. du Jard. Bot. de Tiflis i. 12 (1905).

Urmia district, Mt. Sir, 21.5.26, flowers a rather light blue, No. 1563; 27.5.28, No. 2261/

Distrib. N. Persia.

C. Gilliatii Milne-Redhead et Turrill, sp. nov.; a *C. stricta* L. habitu naniore foliis spathulato-orbiculatis, et pedunculis multo brevioribus distinguitur.

Planta perennis, caulibus nanis e radice lignosa apice 1 cm. diametro valde ramosis pulvinum densum lignosum formantibus, ramis 8 cm. longis vel saepius brevioribus densissime foliatis senioribus foliorum basibus persistentibus obtectis. *Folia* radicalia spathulato-orbiculata, rosulata; lamina usque ad 1.1 cm. longa, et 1 cm. lata, apice rotundata, basi in petiolum cuneatim vel subabrupte attenuata, margine 3- vel 4-dentata in quoque latere pilis brevibus perpaucis instructa, pagina utraque glabra, pallide viridia; petiolus alatus basique usque ad 1 cm. longus, superne 2.5 mm. latus, medio 1.5 mm. latus, infimus 3 mm. latus, ad 1.5 mm. supra basin ciliatus, superne dentibus minutis circiter 6 instructus; caulina obovato-cuneata, apice tridentata, 0.5 cm. longa, 3 mm. lata, glabra, sessilia. *Rami floriferi* usque ad 3.3 cm. longi, graciles, uniflori (an semper?). *Calycis lobi* triangulari-ovati, subacuti, 5 mm. longi, 4 mm. lati, margine valde ciliati, appendices brevissimi, vix 1 mm. longi. *Corolla* 1.6 cm. longa. *Antherae* lineares, 4.25 mm. longae, 0.75 mm. latae, apice connectivo minute capitulato paeditae; filamentum 1 mm. longum. *Stylus* 11 mm. longus, ramis tribus, 2 mm. longis includentibus papilloso-puberulus. *Receptaculum* glabrum, 3.5 mm. altum, 4 mm. diametro.

Mishou Dagh, August 1929, Gilliat-Smith 2646.

C. glomerata L. Sp. Pl. 166 (1753).

Above Zindjanab, Sahand Range, 26.6.27, flowers dark blue, No. 2502 ; Mishou Dag, 19.7.28, No. 2372 ; 5.8.29, No. 2602.

Distrib. E.N. Temp. Region.

C. involucrata Auch. in DC. Prodr. vii. 467 (1838).

Urmia district, 5.26, flowers violet-blue, No. 1535 ; Mt. Sir, Urmia district, 6.28, No. 2260.

Distrib. Asia Minor, Armenia, N. Persia.

C. propinqua Fisch. et Mey. Ind. Sem. Hort. Petrop. ii. 32 (1836).

North-east of Sandj Bulaq, 5.26, flowers blue, No. 1608 ; Kushtchi Gadugi Pass, north of Urmia, 21.5.28, No. 2262.

Distrib. E. Asia Minor, Armenia, N. Persia.

Some specimens referred by Boissier and other authors to this species belong to another, probably to *C. strigosa* Russ.

C. propinqua Fisch. et Mey., var. **parviflora** Turrill in Kew Bull. 1929, 229.

Yam, Dik Dash, 8.28, flowers blue, No. 2465.

Distrib. (of var.) Endemic.

C. rapunculoides L. Sp. Pl. 165 (1753).

Weed in gardens, Tabriz, 6.7.26, flowers blue, No. 1666 ; 9.6.27, No. 2075 ; near Tabriz, 6.27, No. 2121 (var. vel forma ?)

Distrib. Eur., Asia Minor, Caucasus, Armenia, N. Persia.

No. 2121 is represented by a poor specimen, possibly abnormal. The calyx segments tend not to reflex or spread in the flower.

C. sclerotricha Boiss. Diagn. Ser. I. xi. 66 (1849).

Mishou Dag, waterfall ravine, 13.9.29, flowers blue, No. 2642.

Distrib. N. and W. Persia, Kurdistan.

C. simplex Stev. in Mem. Soc. Nat. Mosc. iii. 225 (1812). *C. Stevenii* M. Bieb. Flor. Taur.-Cauc. 138 (1819).

Above Zindjanab, Sahand Range, 25-27.6.29, flowers blue, No. 2522.

Distrib. Asia Minor, Armenia, Caucasus, N. Persia, Cent. Asia.

C. stricta L. Sp. Pl. ed. 2. 238 (1764), var. **muricata** Trautv. in Acta Hort. Petrop. ii. 563 (1873).

Mishou Dag, 19.7.28, flowers dark blue, No. 2371 ; 5.8.29, No. 2601.

Distrib. (of species) Asia Minor, Syria, Armenia, N. Persia.

(of var.) Armenia, Kurdistan, N. Persia.

Michauxia laevigata Vent. Jard. Cels. 81, t. 81 (1800).

Valley of Livan, cream coloured flowers, a very tall and robust plant up to 9 feet in height, 9.25, No. 1289 ; Yam and Seivan, 24.6.28, No. 2354 ; basal leaves, Yam, 7.28, No. 2432.

Distrib. N. Persia, Armenia.

Grows on rocks of dried-up river beds. Normally in flower at end of June and in July.

Podanthum pulchellum Boiss. Flor. Or. iii. 947 (1875).

Hills south of Tabriz, flowers blue, 11.6.28, and Yam, 24.6.28, No. 2308.

Distrib. N. Persia.

PLUMBAGINACEAE.

Acantholimon bracteatum Boiss. Diagn. Ser. I. vii. 70 (1846).

South east of Lake Urmia, 5.26, flowers pink-purple, No. 1590 ; Urmia district, 5.29, No. 2635.

Distrib. Armenia, N. Persia.

A. Gilliatii Turrill, sp. nov.; ab *A. tenuifloro* Boiss. foliis leviter latioribus rhachide minute hispidulo-puberula differt.

Suffrutex caespitoso-erineus, ramis 5-6. cm. longis inferne foliis vestustis vestitis. *Folia* anguste linearia, acerosa, haud subulato-triquetra, apice acuminato-spinosa, 1.7 cm. longa, 1 mm. vel fere 1 mm. lata, vetusta sub patula sed haud reversim imbricata, margine scabridula, lamina glauco-viride punctata, vagina pallide fulva. *Inflorescentia* foliis multo longiora, usque ad 1.5 dm. longa, in spicam tenue interdum ramosam sub laxam multispiculatam elongata, rhachide leviter flexuosa minute hispidula-puberula; bracteae late scarioso-marginatae, externa triangulari-ovata apice acuminato-spinosa 5 mm. longa 3 mm. lata, interioribus elliptico-oblongis 7 mm. longis 3 mm. latis leviter vel vix carinatis nervo medio in mucronem 0.5-0.75 mm. longum abrupte excurrentem. *Calyx* 1.1 cm. longus, tubo piloso, limbo albo nervis atrorubro-purpureis exceptis. *Corolla* 1.3 cm. longa. *Stamina* 8 mm. longa. *Gynaeceum* 8 mm. longum.

Hills south of Tabriz, 27.6.28, flowers pink, No. 2349.

Some difficulty has been experienced in determining the affinity of this species but it appears to be related to *A. tenuiflorum* Boiss. so far as can be judged from published descriptions and the scanty material at Kew. *A. tenuiflorum* is known only from eastern Transcaucasia, prov. Elisabethpol (see Kuznetsov in Flor. Cauc. Crit. iv. 181-183 (1902).

A. sahendicum Boiss. et Buhse Aufz. 183 (1860).

Heights above Livan, 9.25, corollas deep red, No. 1276 ; Mishou Dagh, 19.7.28, No. 2377 ; 30.8.28, No. 2473 ; 5.8.29, No. 2523.

Distrib. Azerbaidjan.

The colour of the calyces is sometimes white with dark red-purple veins and sometimes the whole is suffused with red.

A. tragacanthinum Boiss. Diagn. Ser. I. vii. 81 (1846).

Hills south of Tabriz, 5-6.26, flowers pink, No. 1631 ; 6.27, Nos. 2069, 2070 ; 6.29, No. 2542 ; Sahand, end of June 1929, No. 2541.

Distrib. N. Persia.

It is doubtful if this species and *A. scorpius* Boiss. are really distinguishable. They have been united by Girard, in Ann. Sci. Nat. Sér. III. ii. 332 (1844), under the name *Statice Spachii*.

A. venustum Boiss. Diagn. Ser. I. vii. 80 (1846).

South-east of Lake Urmia, 25.5.26, flowers pink-purple, very showy, No. 1585; hills south of Tabriz, 5.29, No. 2543.

Distrib. Asia Minor, Iraq, Persia.

There is a fluctuation in the colour of the leaves, amount or absence of indumentum on the inflorescence rhachis, and in the prominence of the calyx nerves.

Acantholimon yamense Turritt, sp. nov.; ab *A. aceroso* Boiss. foliis brevioribus angustioribus tenuioribusque, inflorescentiis tenuioribus praecipue distinguitur.

Suffrutex dumoso-erineus, ramis vetustis elongatis foliorum basibus vestitis. *Folia* acerosissima, triquetria, haud plano-triquetria, apice spinoso-acuminata, basi vaginata, circiter 2.3 cm. longa vagina 5 mm. longa exclusa, 0.5–0.75 mm. lata, margine minutissime scabridula, lamina glauco-viride punctata, vaginis brunneis. *Inflorescentia* foliis longior, in spicam tenuem sublaxam multispiculatam elongata, rhachide flexuosa glabra vel fere glabra haud scabra; bractae late scarioso-marginatae, externa late triangulari-ovata apice acuminato-spinosa 5 mm. longa 4 mm. lata viride rubro-purpurea suffusa, interioribus oblongis carinatis apice vix vel breviter abrupteque spinosis 7 mm. longis 3.5 mm. latis dorso atrorubro-purpureis. *Calyx* 1.2 cm. longus, inferne leviter pilosus, albus, nervis atrorubro-purpureis haud puberulis exceptis. *Corolla* 1.4 cm. longa vel longior. *Stamina* 1.1 cm. longa. *Gynaeceum* 9 mm. longum.

Yam, 24.6.28, grows in huge compact cushions, flowers mauve to pink, No. 2348.

The taxonomic difficulties of the group of species or subspecies centred round *A. acerosum* Boiss. are considered by N. Kuznetsoff in the *Flora Caucasica Critica* iv. pp. 184 seq. (1902) without however overcoming them. The present species is markedly distinct from the true *A. acerosum* (Willd.) Boiss. from Asia Minor as represented by a good series of specimens at Kew, and since it does not fit the description of any other published species it has had to be described as new.

Limonium carnosum O. Kuntze Revis. Gen. Pl. 395 (1891). *Statice carnosus* Boiss. in DC. Prodr. xii. 663 (1848).

Hills north of Tabriz, 29.9.29, flowers a beautiful mauve or lilac, No. 2629.

Distrib. Azerbaidjan.

PRIMULACEAE.

Anagallis foemina Mill. Gard. Dict. ed. viii. (1768).

Near Tabriz, 8.27, flowers blue, No. 2122.

Distrib. Now nearly cosmopolitan.

Androsace maxima L. Sp. Pl. 141 (1753).

Near Tabriz, 9.4.26, flowers white often with a pink tinge, No. 1360 ; in garden, Tabriz, 4.27, No. 2073.

Distrib. E.N. Temp. Region.

A. maxima L., var. **flavida** Gilliat-Smith var. nov. ; floribus flavidis.

Near Tabriz, 20.3.26, No. 1326 ; 9.4.26, No. 1359 ; 4.27, No. 2074. Pale yellow flowers with no tinge of pink. Flowers a little earlier than the white-flowered plants both on the hills and as a garden weed.

Glaux maritima L. Sp. Pl. 207 (1753).

Urmia district, on the plain between the lake and the town of Urmia, 5.26, No. 1530.

Distrib. N. Temp. Region.

Primula auriculata Lam. Illustr. gen. I. 429 n. 193 (1791).

Yam, 22.5.27, in a damp field, flowers pink, No. 2072 ; near Tabriz, flowers along mountain brooks, 20.8.27, No. 2081 ; under Mishou Dag, damp meadows, 9.28, No. 2483 (forma autumnalis, showing secondary flowering after having been eaten by sheep. The plant grows up again and flowers without peduncles).

Distrib. Bithynian Olympus through Asia Minor and the Caucasus, thence to north-west and south Persia.

It is well-known that this species shows many combinations of apparently fluctuating characters. The plants under the numbers quoted are not exactly the same. Thus No. 2072 has slightly shorter corollas and relatively longer calyx lobes and flowers about three months earlier than No. 2081. After a careful examination of the rich material of the species at Kew and of the relevant literature I am unable to give even varietal names to the different collections.

Phytogeographically the species is of interest as being one of those original types which extends westwards to the Bithynian Olympus but has not reached, so far as is known, the Balkan Peninsula.

OLEACEAE.

Fraxinus oxycarpa Willd. Sp. Pl. iv. 1100 (1806). *F. oxyphylla* M. Bieb. Flor. Taur.-Cauc. ii. 450 (1808) ; Boiss. Flor. Or. iv. 40 (1879).

Hills south of Tabriz, Zindjanab torrent, 27.6.29, No. 2572. Turki " Kush dili " = bird's tongue.

Distrib. Medit. Region.

Syringa persica L. Sp. Pl. 9 (1753).

Tabriz, 10.5.26 (in flower), flowers mauve, No. 1493 ; 6.26, No. 1703 (in fruit).

Distrib. Caucasus, N. Persia.

S. vulgaris L. Sp. Pl. 9 (1753).

Tabriz, 10.5.26, No. 1494 (in flower) ; 6.26, No. 1701 (in fruit).

Distrib. S.E. Cent. Eur. and widely cultivated.

S. persica L. × S. vulgaris L.

Tabriz, 10.5.26, No. 1492 (in flower); 6.26, No. 1702 (in fruit).

The lilacs are known locally as "Yasmīn," i.e. Jasmine.

ASCLEPIADACEAE.

Cynanchum acutum L. Sp. Pl. 212 (1753).

Weed in garden, Tabriz, 8.26, No. 1722.

Distrib. E.N. Temp. Region.

GENTIANACEAE.

Centaureum turcicum Ronn. in Mitt. Naturw. Ver. Steiermark lii. 320 (1916).

Yam, 21.8.27, No. 2082; under Mishou Dagħ, 10.9.28, flowers red or pink, No. 2471.

Distrib. Balkan Penins., N. Asia Minor.

Gentiana ciliata L. Sp. Pl. 231 (1753).

Mishou Dagħ, 8.27, flowers blue, No. 2131; Mishou Dagħ, 10.9.28, No. 2470.

Distrib. Cent. Eur., Asia Minor, Armenia, Caucasus, Transcaucasus.

BORRAGINACEAE.

Alkanna orientalis Boiss. Diagn. Ser. I. iv. 46 (1844).

Valley of Livan, chiefly in dry places and also in the driest places on the hills south of Tabriz, smells like cowslips and the plant is sticky and glandular, 8-9.25, flowers bright yellow, No. 1293; hills south of Tabriz, 1.6.28, No. 2302. Flowers from the early spring to May and again in the autumn.

Distrib. S. Balkan Penins., and Orient.

Anchusa italica Retz. Obs. i. 12 (1779).

Near Tabriz, also at Yam, 22.5.26, No. 1629. Grows to a large size and is very showy.

Distrib. Cent. Eur., Medit. Region, Cent. Asia.

A. orientalis Reichb. f. Ic. Flor. Germ. 63, t. 109 (1858).

Valley of Livan, 9.25, flowers blue, No. 1284; garden and corn-field weed near Tabriz, 4.26, No. 1390; near Tabriz, 5.26, No. 1489, Nos. 1624, 1642 (white-flowered); 27.3.27, No. 2058; cultivated at Kew from Tabriz seed as K.435 and 34/28.

Distrib. Medit. Region and Cent. Asia.

Arnebia decumbens Coss. et Kral. in Bull. Soc. Bot. Fr. iv. 398, 402 (1857).

Hills south of Tabriz, 5.5.28, flowers pale yellow, No. 2252 (very young); 11.6.28, No. 2292; near Tabriz, 7.28, No. 2434.

Distrib. Palestine, Syria, Armenia, Iraq, Caucasus, Egypt, Arabia, Persia, N. Afr., Cent. Asia.

Bornmüller in Herb. Kew has a forma *parviflora*, which may be the same as No. 2252. The root contains a purple dye.

A. linearifolia DC. Prodr. x. 95 (1846).

Hills south of Tabriz, 5.26, flowers pale yellow, No. 1603 (very young); Urmia, 25.5.28, No. 2251.

Distrib. Egypt, Arabia, Syria, Armenia, Persia, Baluchistan.

Asperugo procumbens L. Sp. Pl. 138 (1753).

In cornfields near Tabriz, 4.26, flowers dark blue, No. 1388; garden weed near Tabriz, 29.4.26, No. 1449.

Distrib. E.N Temp. Region.

Bilegnum medium Turvill in Kew Bull. 1929, 232.

Urmia district, 21.5.26, No. 1542.

Endemic.

Borrago officinalis L. Sp. Pl. 137 (1753).

Near Tabriz, cultivated, 7.26, No. 1667.

Distrib. Medit. Basin, and a, ruderal in Cent. Eur.

Caccinia Rauwolfii C. Koch in Linnaea xvii. 303 (1843).

Near Zandjan, 3.5.28, and hills west of Tabriz, 1.5.28, No. 2264. Also on the hills north of Tabriz, flowers pink.

Distrib. Caucasus, Persia.

Root sometimes as thick as a man's thigh and as long as his leg, often forked. Used medicinally and known locally as "Tchilledagh."

Cerinth minor L. Sp. Pl. 137 (1753), var. **hispida** Turvill in Kew Bull. 1924, 355.

Yam, 21.8.27, No. 2135; 22.5.27, No. 1860.

Distrib. (of species) Cent. Eur. and Medit. Region.

(of var.) E. Medit. Basin and Orient.

Echium italicum L. Sp. Pl. 139 (1753), sensu Boiss. Flor. Or. iv. 205 (1879).

Yam, 24.6.28, pale blue to pinkish, No. 2337.

Distrib. Medit. Region and Cent. Eur.

Heliotropium dolosum De Not. Repert. Flor. Ligur. in Mem. Acc. Tor. ix. 318 (1848).

Near Tabriz, 9.25, flowers white, No. 1308; weed in garden, near Tabriz, 6.27, No. 2126.

Distrib. E. Medit. Basin, Orient, Cent. Asia.

For a note on the nomenclature of this and the next species see *Kew Bull.* 1929, 230.

H. ellipticum Ledeb. in Eichw. Pl. nov. Casp.-Cauc. 10, t. iv. (1831-33).

Hills to the south of Tabriz, 11.6.27, flowers white, No. 2060; near Tabriz, 4.6.27, No. 2127; 6.28, No. 2433.

Distrib. Medit. Region to Cent. Asia.

Lappula barbata Gürke in Engl. u. Prantl Naturl. Pflanzenfam. iv. 3a, 107 (1893).

Near Tabriz, garden weed, 2.5.26, No. 1470 ; near Tabriz, 5.26, No. 1546. Also on roadsides at Yam and round Lake Urmia. Flowers *Myosotis*-colour.

Distrib. S.E. Eur., Asia Minor, Armenia, Transcaucasus, Syria, N. Persia, Cent. Asia.

L. echinophora *O. Kuntze* in Act. Hort. Petrop. x. 214 (1887).

Weed in garden near Tabriz, 26.4.26, No. 1418 ; 16.5.26, No. 1507 ; south of Maragha, 5.26, No. 1607 ; weed in a garden, south of Tabriz, 5.28, No. 2255. Also seen south-east of Lake Urmia. Flowers very dark blue.

Distrib. Asia Minor, Transcaucasus, Persia, Turkestan, Cent. Asia.

Lappula sp. ?

Hills north of Tabriz, 28.4.29, No. 2553. Too young for determination.

Lithospermum arvense *L.* Sp. Pl. 132 (1753).

Near Tabriz, garden weed, 4.26, No. 1382 ; garden in hills south of Tabriz, 29.4.26, No. 1429 ; 26.3.27, No. 2059 ; Urmia, 29.5.28, No. 2256.

Distrib. E.N. Temp. Region.

Flowers often pink, not blue, though the pink turns blue in drying, more usually white. The nutlets remain brown, rarely becoming white.

Moltkia caerulea *Lehm.* in Neue Schr. Naturf. Ges. Halle iii. II. 6 (1817).

Hills south of Tabriz, 4.26, No. 1450 ; 2.5.26, No. 1468 ; 20.4.27, No. 2061. Flowers rather dark blue, from mid-April to the end of May and beginning of June.

Distrib. Asia Minor, Syria, Armenia, N. Persia.

Myosotis silvatica *Hoffm.* Deutschl. Flor. ed. 1, 61 (1791) ; ed. 2, 85 (1800).

Mishou Dagh, 22.5.27, No. 1791.

Distrib. E.N. Temp. Region.

Nonnea melanocarpa *Boiss.* Diagn. Ser. I. xi. 96 (1849).

Garden in hills south of Tabriz, 11.5.27, flowers purple-black, No. 1442 (?) ; near Tabriz, 11.5.27, No. 1861 ; garden weed and hills south of Tabriz, 4.28, No. 2254.

Distrib. Palestine, Syria, Persia.

No. 1442 is somewhat doubtfully identified, it may be a hybrid between this species and *N. picta* Fisch. et Mey.

N. picta *Fisch. et Mey.* Ind. Sem. Hort. Petrop. ii. 43 (1836).

Garden in hills south of Tabriz, 29.4.26, flowers dark pink, No. 1443 ; hills south of Tabriz, 6.5.27, No. 1835. Flowers normally from early May to July.

Distrib. Orient, Cent. Asia.

Onosma bilabiatum Boiss. et Buhse Aufz. 153 (1860). *O. elwendicum* Wettst. in Denk. Math.-Naturw. Cl. k. Akad. Wiss. I. 28 (1885).

South-east of Lake Urmia, 26.5.26, flowers pale yellow, No. 1589 ; Shor Dara (Dere), 22.5.27, Nos. 1833, 1834 ; Dik Dash, Yam, 21.8.27, No. 2096 ; hills south of Tabriz, 6.28, No. 2350 ; Yam, 25.7.29, No. 2581.

Distrib. N. Persia.

One additional specimen, No. 2351, from Yam, 6.28, may be a hybrid between this species and *O. sericeum*.

O. microspermum Stev. in Bull. Soc. Imp. Nat. 1838, 305, Boiss. Flor. Or. iv. 191 (1879).

Heights above Livan, also hills south of Tabriz, flowers bright yellow, 8-9.25, No. 1275 ; near Tabriz, 12.5.27, No. 1832 ; hills north of Tabriz, 24.4.29, No. 2559.

Distrib. Armenia, Caucasus, Kurdistan, Persia.

O. petiolatum Turritt in Kew Bull. 1929, 234.

Yam, 19.7.28, flowers yellow, No. 2435.

Endemic.

O. sericeum Willd. Sp. Pl. i. 774 (1798).

Urmia district, 5.26, No. 1543 ; near Tabriz, 5.26, flowers yellow, No. 1595.

Distrib. N. and E. Asia Minor, Armenia, Caucasus, N. Persia.

O. flavum Boiss. is probably not specifically distinct.

Paracaryum undulatum Boiss. Diagn. Ser. I. xi. 129 (1849).

Hills south of Tabriz, 5.26, No. 1685 ; 12.5.27, No. 1836. Flowers from mid-May to July in varying shades of dark pink and purple.

Distrib. N. Persia.

Rindera (Cyphomattia) lanata Gürke, var. *canescens* Kuznetsoff in Trav. Mus. Bot. Acad. Imp. St. Petersb. vii. 48 (1910).

Urmia district, 20.5.26, No. 2531 ; Mishou Dagh, 5.27, No. 1859 (very young) ; Band, 25.5.28, and Sir, 27.5.28, No. 2257 ; above Zindjanab, Sahand Range, 26.6.29, No. 2508.

Distrib. Asia Minor, N. Syria, Iraq, Armenia, Persia.

Rochelia disperma Hochr. in Ann. Conserv. et Jard. Bot. Genève vii.-viii. 195 (1904). *R. stellulata* Reichb. in Flora vii. 243 (1824).

Garden in hills south of Tabriz, 5.26, Nos. 1428, 1545. Flowers *Myosotis*-blue.

Distrib. S.E. Eur., Medit. Region, Cent. Asia.

CONVOLVULACEAE.

Convolvulus arvensis L. Sp. Pl. 153 (1753).

Yam, 8.27, No. 2023 ; Tabriz, garden weed, 7.27, No. 2064.

Distrib. Now practically cosmopolitan.

C. commutatus Boiss. Diagn. Ser. I. xi. 81 (1849).

East of Lake Urmia, 5.26, flowers white with a pink tinge, No. 1594; hills north of Tabriz, 15.5.27, No. 2062 (forma vel var.); 5.29, No. 2546.

Distrib. Iraq, Armenia, N. Persia.

For a note on this species see *Kew Bull.* 1929, 230.

Cuscuta approximata Bab. in Ann. & Mag. Nat. Hist. xiii. 253 (1844).

Near Tabriz, 18.7.27, flowers white, No. 1988; weed in garden near Tabriz, 7.28, No. 2431.

Distrib. Medit. Region and Cent. Asia.

SOLANACEAE.

Hyoscyamus niger L. Sp. Pl. 179 (1753).

Yam, 5.27, No. 2115. Also seen near Urmia 1926.

Distrib. E.N. Temp. Region.

H. pusillus L. Sp. Pl. 180 (1753).

Near Tabriz, 16.5.26, flowers clear yellow, No. 1505; 10.5.26, No. 1683; near Zandjan, 3.5.28, No. 2253.

Distrib. Orient and Cent. Asia.

H. reticulatus L. Sp. Pl. ed. 2. 257 (1762).

Near Tabriz, 4.26, Nos. 1386, 1387; 29. 4.26, No. 1458; 25.4.27, No. 2114.

Distrib. Asia Minor, Armenia, Iraq, Transcaucasus, Persia.

Flowers from end of April to July. The flowers in the bud are often the colour of *H. niger* but later become a beautiful purple or vary from pink to purple or are even a dirty cream. No. 1386 has the floral parts in sixes. The long thick silvery indumentum of young plants glistens marvellously in the sun.

Lycium ruthenicum Murr. in Comm. Götting. 1779, 9, t. 2 (1780).

Near Tabriz, in waste places, cemeteries, and gardens, 8.25 (fruiting), No. 1300; 6.26, No. 1712; 22.6.27, No. 2042. Fruit black and globular, flowers light violet.

Distrib. S. Russia, Transcaucasus, N. Persia, Turkestan, Cent. Asia.

Solanum Dulcamara L. Sp. Pl. 186 (1753), var. **indivisum** Boiss. Flor. Or. iv. 285 (1879).

Near Tabriz, 8.27, flowers violet, No. 2124.

Distrib. (of species) E.N. Temp. Region.

(of var.) here and there with the species, especially in the Orient.

S. nigrum L. Sp. Pl. 186 (1753), var. **humile** Boiss. Flor. Or. iv. 284 (1879).

Weed in garden, near Tabriz, 8.27, No. 2123a. Fruits orange-yellow coloured, flowers white.

Distrib. (of species) nearly cosmopolitan.

(of var.) Medit. Region.

SCROPHULARIACEAE.

Bunaea trifida C. A. Mey. Verz. Pfl. Cauc. 109 (1831).

Urmia district, 5.26, No. 1524; hills to the north of Tabriz, 15.5.28, and Mt. Sir, 27.5.28, No. 2328; above Zindjanab, Sahand Range, 25-27.6.29, No. 2512.

Distrib. Asia Minor, Armenia, Persia.

Celsia persica C. A. Mey. Verz. Pfl. Cauc. iii (1831).

Hills south of Tabriz, 5.26, No. 1682. Flowers primrose-yellow from the end of May till autumn.

Distrib. N. Persia.

Euphrasia pectinata Ten. Flor. Nap. i. Prodr. 36 (1811); Wettst. Monogr. Euphrasia 82 (1896).

Mishou Dag, 8.29, flowers white, No. 2607.

Distrib. Medit. Region.

Linaria dalmatica Mill. Gard. Dict. ed. viii. (1768).

Valley of Livan and heights around, 6.9.25, flowers yellow. No. 1291.

Distrib. S.E. Eur., Balkan Penins., Orient.

L. dalmatica Mill. var. **grandiflora** Boiss. Flor. Or. iv. 376 (1879).

Above Zindjanab, Sahand Range, 25-27.6.29, flowers yellow, No. 2509.

Distrib. (of var.) Orient.

One specimen, No. 2396, near Tabriz, 8.28, is intermediate between the type and var. *grandiflora* Boiss. in the size of its flowers.

L. kurdica Boiss. et Hohen. in Boiss. Diagn. Ser. I. iv. 73 (1844).

Mishou Dag, near the summit, 30.8.28, flowers yellow, No. 2477.

Distrib. E. Asia Minor, Kurdistan, Armenia, N. Persia.

The specimen is rather a poor one with the fruits somewhat smaller than in authenticated material.

L. lineolata Boiss. Diagn. Ser. I. xii. 42 (1853).

Near Tabriz, 5.6.27, flowers yellow with violet-brown veins, No. 1882; hills to the south of Tabriz, 5.6.27, No. 2030.

Distrib. Persia.

L. lineolata Boiss., var. **latifolia** Turrill var. nov.; a planta vulgare foliis usque ad 4.5 cm. longis et 1.1 cm. latis differt.

Yam, 8.27, No. 2014; Sir, 27.5.28, No. 2329.

This broad-leaved variety is in foliage characters quite distinct from the common examples of this species. It recalls some of the varieties of *L. genistifolia* Mill. but has the violet reticulate venation of the corolla described as characteristic of *L. lineolata*. It is doubtful if the var. *venosa* Boiss. of *L. genistifolia* is distinct from *L. lineolata*. It was described by Boissier and Reuter as a distinct species—*L. Balansae* in Boiss. Diagn. Ser. II. iii. 163 (1856).

The following floral measurements of the var. *latifolia* may be useful : *Calyx* segments linear, acute, 4-5 mm. long, 1.5 mm. broad, margin slightly ciliate. *Corolla* (without spur) 1.2 cm. long ; spur 8 mm. long.

L. persica Chav. Monogr. 173 (1833).

Near Tabriz, 29.5.27, No. 1883 ; hills south of Tabriz, 5.29, No. 2565. Flowers violet-coloured.

Distrib. Asia Minor, Syria, Armenia, Transcaucasus, N. Persia, Turkestan.

Linaria sp.*

Near Tabriz, 6.28, No. 2412.

Odontites Aucheri Boiss. Diagn. Ser. I. iv. 74 (1844).

Yam, 12.7.28, flowers yellow, No. 2397 ; Mishou Dagh, Yam, 9.28, No. 2476.

Distrib. Asia Minor, Armenia, Syria, Persia.

Pedicularis comosa L. Sp. Pl. 609 (1753), var. **acmodonta** Boiss. Flor. Or. iv. 492 (1879).

Yam, 11.5.28, No. 2327.

Distrib. (of species) E.N. Temp. Region.
(of var.) Orient.

Scrophularia alata Gilib. Flor. lith. i. 127 (1781), var. **pubescens** Turvill var. nov. ; foliis cordatis junioribus praecipue pagina utraque inferiore densius pubescentibus distinguitur.

In gardens north-east of Tabriz, 6.27, No. 2031.

Distrib. (of species) Eur., Orient, Cent. Asia.

This variety agrees with the var. *cordata* Boiss. in having the leaf-bases cordate but the definite indumentum is not found in Oriental material at Kew nor mentioned in any varietal description.

S. variegata M. Bieb. Flor. Taur.-Cauc. ii. 78 (1808).

Hills south of Tabriz, 5.26, flowers reddish-brown, No. 1639 ; 23.6.27, No. 2032 ; Dik Dash, Yam, 21.8.27, Nos. 2090, 2095 ; Yam, 11.5.28, No. 2330 ; hills south of Tabriz (fruit) 6-8.28, No. 2331.

Distrib. Asia Minor, Caucasus, Armenia, Syria, Iraq, Persia.

The species is known to be very polymorphic but it is with some hesitation that the above specimens have all been considered conspecific. It is doubtful if the shape of the staminode is a reliable taxonomic character. No. 2094 and perhaps No. 2330 are best placed under the var. *rupestris* Boiss. Flor. Or. iv. 417 (1879).

Verbascum speciosum Schrad. Hort. Gotting. 22, t. 16 (1809).

Hills to the south of Tabriz, in large colonies, 9.6.27, flowers yellow, No. 2033.

Distrib. Cent. and S.E. Eur., Asia Minor, Armenia, N. Persia.

Veronica anagallis-aquatica L. Sp. Pl. 12 (1753).

Near Tabriz, 21.8.27, flowers blue, No. 2112.

Distrib. E.N. Temp. Region.

V. Biebersteinii Richter in Denkschr. Math.-Nat. Cl. K. Akad. Wiss. 1. 24 (1885). *V. multifida* M. Bieb. vix Linn.

Hills south of Tabriz, 29.4.26, flowers blue, No. 1430 ; 5.5.29, No. 2558.

Distrib. Asia Minor, Armenia, Caucasus.

V. campylopoda Boiss. Diagn. Ser. 1. iv. 80 (1844).

Near Tabriz, 14.4.26, flowers dark blue, No. 1370 ; garden weed, Tabriz, 4.26, No. 1383 ; Tabriz, 29.4.26, No. 1456 ; cultivated at Kew as K. 403, 1927. Flowers in April and May.

Distrib. Asia Minor, Syria, Armenia, Iraq, Persia, Afghanistan, Baluchistan.

V. hederifolia L. Sp. Pl. 13 (1753).

Tabriz, garden weed, 12.3.26, flowers pale lilac-blue, No. 1321 ; 11.5.27, No. 2038.

Distrib. Eur. and Medit. Region.

V. intercedens Bornm. in Beih. Bot. Centrbl. xxii. II. 112 (1907)

Band, 2.5.28, No. 2324.

Distrib. Kurdistan.

V. kurdica Benth. in DC. Prodr. x. 473 (1846).

Zindjanab, 6.29, No. 2638.

Distrib. Armenia, Persia.

V. microcarpa Boiss. Diagn. Ser. 1. iv. 76 (1844).

Khoi, 21.5.28, and Band, 25.5.28, flowers blue, No. 2325.

Distrib. N. Persia, Armenia.

V. orientalis Mill. Gard. Dict. ed. viii (1768).

Hills south of Tabriz, 21.5.27, flowers blue, No. 2036 ; Band, 25.5.28, No. 2326.

Distrib. Crimea, Asia Minor, Armenia, Iraq, Persia.

V. orientalis Mill., var. *tenuifolia* Boiss. Diagn. Ser. II. iii. 167 (1856).

Near Tabriz, 5.26, flowers blue, No. 1736 ; Mishou Dag, 22.5.27, No. 2037.

Distrib. (of var.) Crimea, Armenia, Iraq, N. Persia.

Plants with characters intermediate between those of *V. orientalis* Mill. and those of *V. Biebersteinii* Richter, so far as can be judged from the available material, are Nos. 2034, 2035, hills south of Tabriz, 5.27.

V. polita Fries Novit. Flor. Suec. ed. II. 1 (1828).

Tabriz, garden weed, 12.3.26, flowers blue, No. 1322. Flowers all the winter and on to April.

Distrib. E.N. Temp. Region.

V. triphyllus L. Sp. Pl. 14 (1753).

Hills south of Tabriz, 5.5.26, flowers blue, No. 1477.

Distrib. Cent. Eur. and Medit. Region.

OROBANCHACEAE.

Orobanche aegyptiaca Pers. Syn. ii. 181 (1807).

Hills south of Tabriz, 11.25, No. 1310; a very beautiful violet-mauve colour, 9.27, No. 2171.

Distrib. N. Afr., Cyprus, Palestine, east to Persia and N. India.

O. caesia Reichb. Icon. vii. 48, f. 936 (1829).

Tabriz, 8.26, No. 1728.

Distrib. S. Russia, Armenia, to Cent. Asia.

This is probably the β *borealis* Turcz. var. *caucasica* Beck in Verhl. Zool.-Bot. Ges. Wien. lx. 158 (1910) of which I have not succeeded in tracing the original description.

PEDALIACEAE.

Sesamum indicum L. Sp. Pl. 634 (1753).

Near Tabriz, 9.27, flowers white or cream white, No. 2155. Locally known as "Kundjid."

Distrib. Widely cultivated and occurring as an escape from cultivation in the East. Native country unknown, but possibly India.

The capsules are shorter than in most specimens at Kew.

SELAGINACEAE.

Globularia trichosantha Fisch. et Mey. Ind. Sem. Hort. Petrop. v. 36 (1839).

Urmia district, 5.26, sky blue, No. 1539; Sir, Urmia district, 27.5.28, No. 2263. Also seen on Mishou Dag.

Distrib. Asia Minor, Armenia, Syria.

Gymnandra stolonifera C. Koch in Linnaea xvii. 289 (1843).

Yam, roadsides, 11.5.28, flowers blue, No. 2265.

Distrib. Asia Minor, Armenia, Persia, Afghanistan, W. Himalayas.

LABIATAE.

Ajuga chamaecistus Ging. ex Benth. Lab. Gen. et Sp. 698 (1835).

East of Lake Urmia, 5.26, No. 1588.

Distrib. Persia.

A. chia Schreb. Pl. Vert. Unilab. 25 (1774).

North-east of Tabriz, 29.10.27, flowers yellow, No. 2184.

Distrib. S. Balkan Penins. east to Persia.

Calamintha graveolens Benth. DC. Prodr. xii. 231 (1848).

Mishou Dag, 22.5.27, No. 1797, 2053.

Distrib. E. Medit. Region.

Clinopodium vulgare L. Sp. Pl. 587 (1753).

Mishou Dagh, waterfall ravine, 13.9.29, flowers red-purple, No. 2641.

Distrib. E.N. Temp. Region.

Dracocephalum Moldavica L. Sp. Pl. 595 (1753).

Tabriz, cultivated in gardens as a pot-herb, 7.28, flowers violet-blue, No. 2407; Tabriz, 7.28, No. 2478.

Distrib. Original home probably the W. Himalayas, now widely spread as a cultivated plant and alien in many parts of the N. Temp. Region.

This plant is said to be called locally by the Persian name of "Badirash-Bu," but this name is applied to all kinds of plants with a smell like "balm." This one certainly smells like *Melissa officinalis*.

Eremostachys laciniata Bunge in Ledeb. Flor. Alt. ii. 416 (1830).

Mt. Sir, Urmia district, 5.26, flowers cream white, No. 1529; hills south of Tabriz, 6.27, No. 1967.

Distrib. Asia Minor, Syria, Palestine, Transcaucasus.

E. macrophylla Montb. et Auch. in Ann. Sci. Nat. Sér. vi. 54 (1836).

Band, Urmia, 25.6.28, flowers cream-yellow, No. 2228; hills north of Tabriz, 15.5.28, No. 2229.

Distrib. E. Asia Minor, Armenia, Iraq, Persia.

E. Tournefortii Jaub. et Spach Ill. Or. v. 12, t. 412 (1853-57).

Near Khoi, 21.5.28, and Sir, Urmia district, 27.5.28, flowers cream-white, No. 2230.

Distrib. Azerbaidjan, Armenia.

The drawing associated with the original description is decidedly inaccurate.

Lallemantia iberica Fisch. et Mey. Ind. Sem. Hort. Petrop. vi. 53 (1840).

Hills to the south of Tabriz, 5.6.27, No. 1798, flowers violet-blue; above Zindjanab, Sahand Range, 25-27.6.29, No. 2503, flowers violet-blue but the plant as tall and big as the cultivated var. *albiflora*; cultivated at Kew from Tabriz seeds as 44b, 29.6.28.

Distrib. Asia Minor, Armenia, N. Persia, Iraq, Palestine.

L. iberica Fisch. et Mey., var. **albiflora** Turvill; floribus albis. *L. iberica* f. *albiflora* E. Bordzil in Mem. Soc. Nat. de Kiew xxv. 106 (1915).

Near Tabriz, 6.7.26, No. 1658; cultivated at Tabriz from seeds obtained in the bazaar, in flower 5.28, in fruit 6-7.28, Nos. 2306, 2436.

Distrib. Cultivated in Persia.

This variety is cultivated as a pot-herb and as a medicinal herb for the nutlets. It is known in Turki as "Gara za'raḳ," i.e. "little black seeds." The flowers are white or more rarely a cream colour and only the white or cream flowered plants are cultivated.

Lamium album L. Sp. Pl. 579 (1753).

Above Zindjanab, Sahand Range, 25-27.6.29, No. 2525.

Distrib. E.N. Temp. Region.

L. amplexicaule L. Sp. Pl. 579 (1753).

Near Tabriz, 5.26, No. 1484.

Distrib. E.N. Temp. Region.

Marrubium astracanicum Jacq. Ic. Pl. Rar. i. 11, t. 109 (1781-86).

Urmia district, 21.5.26, flowers light pink or purple, No. 1553.

Distrib. Asia Minor, Armenia, N. Persia.

M. parviflorum Fisch. et Mey. Ind. Sem. Hort. Petrop. i. 33 (1835).

Dik Dash, Yam, 24.6.28, flowers white, No. 2342 ; Yam, 7.8.29, No. 2545.

Distrib. Asia Minor, Armenia, N. Persia.

M. persicum C. A. Mey. Verz. 95 (1831).

Near Tabriz, 10.6.27, flowers light purple, No. 1872 ; hills south of Tabriz, 14.6.28, No. 2241.

Distrib. Transcaucasus, N. Persia.

M. propinquum Fisch. et Mey. Ind. Sem. Hort. Petrop. i. 33 (1835).

Near Tabriz, 5.26, flowers light purple, No. 1572 ; south-east of Tabriz, in a garden, 16.5.28, No. 2239 ; Tabriz, in a garden, 5.6.28, No. 2240.

Distrib. N. Persia.

Mentha mollissima Borckh. ex Gaertn. Mey. et Scherb. Flor. Wett. ii. 348 (1800).

Yam, 7.8.27, flowers purplish mauve, No. 1960.

Distrib. E.N. Temp. Region.

M. spicata L. Sp. Pl. 576 (1753), α **viridis** L. Sp. Pl. 576 (1753).

Near Tabriz, cultivated in a garden, 7-8.27, flowers purplish mauve, No. 1966.

Distrib. Eur.

The species does not fruit in the Tabriz district but is propagated vegetatively only.

Nepeta heliotropifolia Lam. Dict. i. 711 (1785).

Yam, 11.5.28, No. 2225. Flowers violet-blue, May to June, and fruits July to August.

Distrib. E. Asia Minor, Iraq, N. Persia.

N. longiflora Vent. Jard. Cels. 66, t. 66 (1800).

Yam, 24.6.28, No. 2343.

Distrib. Persia.

N. micrantha *Bunge* in Ledeb. Flor. Alt. ii. 401 (1830).

Hills south of Tabriz, 5.5.26, flowers pale pinkish violet, No. 1476; near Tabriz, 6.7.26, No. 1674; 5.26, No. 1739; 21.5.27, No. 1873; 7.29, No. 2531; cultivated at Kew from Tabriz seed as K. 440, 21.7.27.

Distrib. Armenia, Persia, Turkestan, Baluchistan.

N. Mussinii *Spreng.* ex Henck. Adumb. Pl. Hort. Hal. 15 (1806); Boiss. Flor. Or. iv. 660 (1879).

Valley of Livan, 9.25, flowers pale violet-blue, No. 1288; Urmia district, 5.26, No. 1561; near Tabriz, 5.27, No. 1874.

Distrib. Transcaucasus, Armenia, N. Persia.

N. ucranica *L.* Sp. Pl. 570 (1753).

Band, Urmia, 25.6.28, No. 2227.

Distrib. Transylvania, S. Russia, E. Asia Minor, Caucasus, Armenia, Cent. Asia.

No. 2226 from Band and pass between Khoi and Salmas 21-25.5.28, may be a very young state of this species.

Nepeta sp.

Hills south of Tabriz, along the Zindjanab torrent, 27.6.29, flowers purple-violet, No. 2570.

This appears to represent a new species of the Section *Euneptea*, Subsection *Microneptea*. The material available, however, is insufficient for making a good description.

Ocimum Basilicum *L.* Sp. Pl. 597 (1753).

Cultivated at Tabriz as a pot-herb, 8.28, flowers white with a pink tinge, No. 2406. Persian and Turki "Reihan."

Distrib. Widely cultivated in the Medit. Region.

Phlomis armeniaca *Willd.* Sp. Pl. iii. 119 (1801).

North-east of Saudj Bulaq, flowers orange-yellow, very showy, 5.26, No. 1584.

Distrib. Throughout Asia Minor to Armenia, Caucasus, and N. Persia.

This is the narrow-leaved variety or form equivalent, according to the description, to *P. lanceolata* Boiss. Diagn. Ser. i. v. 36 (1844). That it is also the original *armeniaca* of Willdenow becomes evident from his description "foliis omnibus petiolatis lanceolatis."

P. armeniaca *Willd.*, var. **subcordata** *Bornm.*, in Herb. Kew. Iter Pers.-tunc. 1657, 1658 (1893).

Near Yam, 8.27, No. 1964.

Distrib. (of var.) Kurdistan, E. Asia Minor.

It is well-known that in leaf-shape plants of *P. armeniaca* sometimes approach *P. orientalis* Mill. Gard. Dict. ed. viii. (1758). I have not been able to trace the publication of Bornmüller's very suitable name in any of his papers, but it is useful for those plants where the leaves, especially or only the lower ones, are slightly cordate.

P. pungens Willd. Sp. Pl. iii. 121 (1801). *P. herba-venti* L. var. *tomentosa* Boiss. Flor. Or. iv. 791 (1879).

Near Tabriz, 21.8.27, flowers purple-pink, No. 2129; Yam, 24.6.28, No. 2339. The seed apparently does not always set.

Distrib. Balkan Penins. eastwards to Persia.

P. tuberosa L. Sp. Pl. 586 (1753).

Top of Dik Dash, Yam, 24.6.28, flowers purplish pink, No. 2341; also seen on Mishou Dagh in August.

Distrib. Cent. Eur. to the Caucasus and Cent. Asia.

Prunella vulgaris L. Sp. Pl. 600 (1753).

Yam, wet grassy fields, 7.28, flowers purple-blue, No. 2376.

Distrib. Now nearly cosmopolitan.

Salvia aethiopis L. Sp. Pl. 27 (1753).

Yam, 7.29, flowers white, No. 2527.

Distrib. Cent. and S. Eur. east to N. Persia.

S. armeniaca Grossheim (?) in Beih. Bot. Centrbl. xlv. 237 (1927). *S. staminea* var. *armeniaca* E. Bordzil, in Trav. du Soc. des Nat. de Kiew xxv. (1915).

Pass between Khoi and Salmas, 21.5.28, flowers white, No. 2235.

Unfortunately neither specimens nor description are available for comparison and the suggested identification is based on the resemblance of our plant to *S. staminea*.

S. ceratophylla L. Sp. Pl. 27 (1753).

Near Tabriz, 27.5.27, flowers white, No. 1865.

Distrib. Asia Minor, Armenia, Syria, Iraq, Persia.

S. (Sect. Aethiopis § Gongrosphaceae) Gilliatii Turrill sp. nov.; a *S. cyanescente* Boiss. et Huet planta tota minus tomentosa, foliis basi gradatim attenuatis, corollae labio superiore majore differt.

Herba perennis usque ad 4.5 dm. alta, caule ascendente pilis crispis et longis et brevibus praedito. *Folia* inferiora anguste elliptica, apice acuta vel subacuta, basi in petiolum 2–3 cm. longum gradatim attenuata, petiolo incluso 10–12 cm. longa, 2–3 cm. lata, utrinque leviter tomentoso-pilosa, glandulis aureis perpaucis instructa, in pagina inferiore costa nervisque prominentibus, superiore costa subprominente nervis impressis saepe plus minusve rugosa, margine irregulariter crenata vel fere lobata; caulina petiolo breviora vel foliis sessilibus. *Inflorescentia* ramosa, laxa, multiflora, verticillastris 2–5-floris, laxa, 2.6 dm. longa, glanduloso-pilosa; bracteae late ovatae apice attenuato-spinosae, 9 mm. longae, 7 mm. latae, longe pilosae. *Calyx* 1.1 cm. longus, lobis 4–5 mm. longis acuminato-spinosis, pilosus, glandulis aureis sessilibus dispersis instructus. *Corolla* 1.8 cm. longa, leviter pilosa et glandulis aureis paucis instructa, labio superiore 8–9 mm. longo, inferiore 9 mm. lato. *Filamenta* glabra. *Stylus* in parte media pilosulus, inferne glaber longe exsertus.

Pass between Khoi and Salmas, 21.5.28, flowers bluish-white with yellowish tinge, No. 2234.

In addition to its relationship to *S. cyanescens* this plant is in certain respects intermediate between *S. sahendica* Boiss. et Buhse and *S. limbata* C. A. Mey. Unfortunately no type specimens of the former are available for comparison but the obvious spreading branching of the inflorescence and its general lax nature seem to prevent our plant being placed under it, though further collecting may indicate that *S. limbata*, *S. sahendica*, and *S. Gilliatii* are all varieties or forms of one polymorphic species.

S. Hydrangea Benth. Lab. Gen. et Species 717 (1835).

Urmia district, 5.26, flowers and bracts purplish-pink, No. 1537 ; east of Lake Urmia, 5.26, No. 1591 ; Sir, Urmia, 27.5.28, No. 2231 ; hills south of Tabriz, 11.6.28, No. 2232. Turki "Issikuttuz." The inflorescence is used in making medicinal tea.

Distrib. N. Persia and Kurdistan.

There is considerable variation in the size of the flowers and the density of the inflorescence, and the series undoubtedly links the species with *S. Sheilii* Boiss. Diagn. Ser. I. vii. 45 (1846).

S. limbata C. A. Mey. Verz. 86 (1831).

Mishou Dagħ, 12.7.28, flowers whitish, No. 2402 (var. ? calyce longe papilloso-hirsuto pilis albis vel purpureis instructo, floribus subminoribus) ; Yam, 20.7.28, No. 2403.

Distrib. N. Persia, Armenia.

S. nemorosa L. Sp. Pl. ed. 2. 35 (1762).

Near Tabriz, 26.5.26, flowers from purple to violet-purple, No. 1656, only as a weed in gardens ; cultivated at Kew from Tabriz seed, as K.429, 10.7.28, 14.8.28, and 13.10.28. At Tabriz flowers from end of May onwards.

Distrib. E.N. Temp. Region.

S. officinalis L. Sp. Pl. 23 (1753).

Tabriz, cultivated in a garden, 5.26, flowers violet-blue, No. 1664. It has no local name and is not in use by the natives.

Distrib. Medit. Basin.

S. sahendica Boiss. et Buhse Aufz. 172 (1860).

Near Tabriz, one of the commonest plants on the hills everywhere, 8-9.25, flowers white occasionally with a bluish tinge, No. 1296 ; 7.26, No. 1696 ; 7.27, No. 1864 (one sheet with broader, one with narrower leaves) ; above Zindjanab, Sahand Range, 25-27.6.29, No. 2516 (broader leaves).

Distrib. Azerbaidjan.

The specimens show a range of fluctuation in leaf size and shape. In damper spots at higher altitudes the plant is much taller and a gradual transition is apparent from the plants on the dry hills south of Tabriz to those in more favourable habitats on the Sahand Range,

where the colouring too is different, the leaves being often dark-purple at the apices and margins, the bracts also dark-purple, and the bluish tinge of the corolla more pronounced.

S. spinosa L. Mant. ii. 511 (1771).

Hills south of Tabriz, near Kulidjan, 29.6.28, No. 2353; plain west of Tabriz, 7.29, No. 2526. The calyx enlarges in the fruit and is then often red; the flowers are white.

Distrib. Arabia, Syria, Iraq, Persia.

S. suffruticosa Montb. et Auch. ex Benth. in Ann. Sci. Nat. Sér. II. vi. 39 (1836).

Urmia district, 5.26, No. 1556; plain below Sir, 27.5.28, No. 2233. Flowers yellow.

Distrib. Syria, E. Asia Minor.

S. syriaca L. Syst. ed. x. 854 (1759).

Sir, in masses all over the plain below, 27.5.28, flowers white, No. 2236.

Distrib. Asia Minor, Syria, Iraq, Armenia, N. Persia.

S. Szovitsiana Bunge. Lab. Pers. 43 (1873).

Urmia district, 21.5.26, flowers purple, No. 1538.

Distrib. N. Persia.

S. verticillata L. Sp. Pl. 26 (1753).

Weed in gardens and waste places near Tabriz, 7.26, No. 1672. Flowers pale violet-mauve, from May to August.

Distrib. Cent. and S. Eur., Asia Minor, Armenia, Caucasus, N. Persia.

S. virgata Boiss. Flor. Or. iv. 627 (1879). ? Ait. Hort. Kew. i. 39 (1789). *S. campestris* Guldenst. e Bornm. Verh. Zool.-Bot. Ges. Wien lx. 162 (1910).

Yam, 7.8.27, flowers violet-blue, No. 1959.

Distrib. Cent. Eur. and Medit. Region.

Satureia hortensis L. Sp. Pl. 568 (1753).

Tabriz, cultivated in garden, 7-8.27, flowers white, pink tinged, No. 2050. Locally known as "Nāna."

Distrib. E.N Temp. Region.

Scutellaria orientalis L. Sp. Pl. 598 (1753), var. **pinnatifida** Boiss. Flor. Or. iv. 682 (1879).

Western end of Shor Dara (Dere), near Mishou Dag, 22.5.27, flowers bright yellow, seeds pale mauve, No. 1867.

Distrib. (of species) Medit. Region and Cent. Asia.

(of var.) E. Medit. Region.

S. pinnatifida Arth. Hamilt. Monogr. Scutell. 16, t. 2. f. 2 (1832); Boiss. Flor. Or. iv. 683 (1879).

East of Lake Urmia, 5.26, flowers bright yellow, No. 1592 ; hills south of Tabriz, 5-6.26, No. 1628 ; 26.5.27, No. 1866.

Distrib. Persia.

S. pinnatifida *Arth. Hamilt. var., mucida* *Bornm.* Iter Persicum alternum 1902, No. 8058 in Herb. Kew. *S. mucida* Stapf in Denkschr. Math. Nat. Cl. K. Akad. Wiss. I. 48 (1885).

Urmia district, 5.26, corolla with upper lip purplish-brown, lower lip yellow, No. 1557 ; plain below Sir, 27.5.28, No. 2237.

Distrib. (of var.) N. Persia.

Sideritis montana *L.* Sp. Pl. 575 (1753).

Valley of Livan, among rocks near torrent, 9.25, No. 1281. Also occurs near Yam and on hills south of Tabriz. The flowers are pure yellow with no brown blotch on any part.

Distrib. S.E. Eur. and Medit. Region.

Stachys fruticulosa *M. Bieb.* Flor. Taur.-Cauc. ii. 51 (1808).

Hills north of Tabriz, 5.26, No. 1711 ; 15.7.27, No. 1875 ; near Band, Urmia district, 25.5.28, No. 2238 ; Yam, 20.7.28, No. 2399 ; Mishou Dag, 12.7.28, No. 2405. Flowers in April and May, in white and pink flowered forms.

Distrib. Caucasus and N. Persia.

S. inflata *Benth.* Lab. Gen. et Species 562 (1834).

Urmia district, 5.26, flowers very showy purple pink, No. 1569 ; near Tabriz, 5.26, Nos. 1578, 1632, 1698.

Distrib. Caucasus, Iraq, Persia.

S. lavandulifolia *Vahl* Symb. Bot. i. 42 (1790).

Urmia district, 20.5.26, flowers purple, No. 1559 ; north-east of Sundj Bulaq, 15.5.26, No. 1580 ; hills north of Tabriz, 15.5.27, No. 2051. Also seen on Mishou Dag and Sahand. Flowers in late April and early May.

Distrib. Asia Minor, Armenia, Caucasus, Kurdistan, Persia.

The plant is used locally as a remedy for spasms and stomach disorders, the whole inflorescence being used as a tea and sold thus in the bazaars. Its local name is "Mardangüş" the ü being mispronounced in Turki as ü in German übel. It probably means "men's-ears" or "men's-fingers" ("Mard-angusht").

S. pubescens *Ten.* Prodr. Flor. Nap. p. xxxiv. (1811-15).

Yam, flowers white, 21.8.27, No. 2207 ; 7.28, No. 2401 ; 13.9.28, No. 2479.

Distrib. E. Medit. Basin east to Armenia and N. Persia.

S. setifera *C. A. Mey.* Verz. 94 (1831).

Near Yam, marshy places, flowers purple, 21.8.27, Nos. 2208, 2209, and fruits 44d (1927) ; 7-8.28, No. 2404.

Distrib. Asia Minor, Caucasus, Persia, Afghanistan.

Teucrium Chamaedrys L. Sp. Pl. 565 (1753).

Mishou Dagh, rocky places, 2.9.29, flowers purple, No. 2631.

Distrib. E.N. Temp. Region.

T. orientale L. Sp. Pl. 562 (1753).

Valley of Livan, 9.25, No. 1295; near Tabriz, 6.26, No. 1695; 29.5.27, No. 1751; hills south of Tabriz, 5-7.27, No. 2052. Flowers violet and very showy.

Distrib. Asia Minor, Syria, Caucasus, Armenia, N. Persia.

No. 1751 certainly, and the remainder probably, belong to the var. *villosum* Benth. in DC. Prodr. xii. 577 (1848). It is doubtful if the variety is more than an extreme development of a fluctuating series.

T. Polium L. Sp. Pl. 566 (1753) s.l.

Hills south of Tabriz, 7.26, flowers dirty white, No. 1740; Mishou Dagh, 8.27, No. 1963; Dik Dash, Yam, 21.8.27, No. 2097.

Distrib. Medit. Region.

The "varieties" of this species require intensive field and breeding studies to be done on them before their taxonomy is clear. The first number quoted above approaches the var. *angustifolium* Benth. and the other two the var. *lanuginosum* Celak. (as determined by Freyn in Herb. Kew.).

Thymus Kotschyanus Boiss. et Hohen. Diagn. Ser. I. v. 16 (1844).

Yam, 22.5.27, flowers shades of pink, No. 1965; near Tabriz, 5.28, No. 2400 (probably the var. *hirtus* Boiss. et Hohen. l.c. 17); above Zindjanab, Sahand Range, 25-27.6.29, No. 2507; Mishou Dagh, 8.29, No. 2608.

Distrib. Asia Minor east to Persia.

This is a very polymorphic species which has not yet been satisfactorily subdivided.

Ziziphora capitata L. Sp. Pl. 21 (1753).

Very common on plain at foot of Mishou Dagh, 5.8.29, flowers purple violet, No. 2587.

Distrib. Medit. Region.

Z. clinopodioides M. Bieb. Flor. Taur.-Cauc. i. 17 (1808), sensu Boiss. Flor. Or. iv. 585 (1879).

Common all over the hills near Livan, 9.25, various shades of pink, mauve, to nearly white, No. 1283; Mishou Dagh, 7.8.27, No. 1961; hills south of Tabriz, 15.7.27, No. 1962.

Distrib. Asia Minor, Armenia, Caucasus, Kurdistan, Persia, Baluchistan, Afghanistan, Cent. Asia.

This species, in the wide sense, is very polymorphic; several of Boissier's varieties have been raised to specific rank, but the reasons for so doing have not been adequately given. Probably Nos. 1283 and 1962 above should be placed under the var. *rigida* [*Z. rigida* Stapf Bot. Erg. Pol.-Exp. Pers. in Denkschr. Math. Naturw. Cl. K. Akad. Wiss. Wien l. 39 (1885)] and No. 1961 approaches most nearly to the var. *canescens*.

Z. tenuior L. Sp. Pl. 21 (1753).

Near Tabriz, 21.5.27, flowers purplish violet, No. 1876a; near Maragha, 5.26, No. 1602; cultivated at Kew from Tabriz seed, as 44a/27, 29.6.28.

Distrib. Asia Minor, Syria, Armenia, Iraq, Persia, Afghanistan, Baluchistan, Cent. Asia.

PLANTAGINACEAE.

Plantago lanceolata L. Sp. Pl. 113 (1753).

Near Tabriz, weed in garden, 8.27, No. 1987; Yam, 8.27, No. 2024. Turki "Bizousha" the "erkek," i.e. male kind.

Distrib. Now practically cosmopolitan.

P. Loefflingii L. Sp. Pl. 115 (1753).

Tabriz, cultivated from seeds obtained from the bazaars, No. 2305; near Tabriz, 5.28, No. 2430. Cultivated as a medicinal herb under the Turki name "Karni YariKh" i.e. "belly wounding."

Distrib. Medit. Region (discontinuous).

One specimen of No. 2305 is very aberrant in having long styles and silky-pubescent bracts and calyx segments. It is named var. **longistyla** var. nov. a planta vulgare bracteis calycis segmentibusque sericeo-pubescentibus, stylis multo longioribus differt.

P. major L. Sp. Pl. 112 (1753).

Near Tabriz, 7.27, No. 1986. Turki name "Bizousha" the "dishi," i.e. female kind.

Distrib. Now practically cosmopolitan.

ILLECEBRACEAE.

Herniaria glabra L. Sp. Pl. 218 (1753) s.l.

Plain under Mishou Dagh, 25.7.29, flowers yellowish-green, No. 2577.

Distrib. Eur., Caucasus, Syria, Cent. Asia.

H. incana Lam. Encyl. iii. 124 (1789); Boiss. Flor. Or. i. 741 (1867).

Urmia, 27.5.28, flowers yellowish-green, No. 2322.

Distrib. W. Eur. and Medit. Region.

Paronychia kurdica Boiss. Diagn. Ser. i. iii. 10 (1843).

Hills north of Tabriz, 5.27, No. 2133; Urmia, 22.5.28, No. 2259; hills south of Tabriz, 14.6.28, No. 2267.

Distrib. Syria, N. and E. Asia Minor, Armenia, Caucasus, Persia.

AMARANTHACEAE.

Amaranthus Blitum L. Sp. Pl. 990 (1753).

Weed in garden near Tabriz, 2.9.27, Nos. 2159, 2160, 2166.

Distrib. Eur., Medit. Region, India.

A. hypochondriacus L. Sp. Pl. 991 (1753).

Weed in garden near Tabriz, 8.7.27, No. 1996; 7.27, No. 2168.

Distrib. Of N. Amer. origin, now a ruderal in the Medit. Region.

A. retroflexus L. Sp. Pl. 991 (1753).

Weed in garden near Tabriz, 1.9.27, No. 2167.

Distrib. Of N. Amer. origin, now a ruderal in Cent. Eur. and the Medit. Region.

Gomphrena globosa L. Sp. Pl. 224 (1753).

Cultivated in a garden near Tabriz, 7.27, No. 2111. Locally known as "Zibā."

Distrib. Tropics of Old World.

CHENOPODIACEAE.

Anabasis aphylla L. Sp. Pl. 223 (1753).

Near Tabriz, in waste places, starts flowering in August, No. 1298 ; 11.10.25, No. 1306 ; 17.7.27, No. 1985 ; 7.27, No. 2158.

Distrib. S. Russia, Transcaucasus, Persia, Turkestan, Cent. Asia.

Atriplex nitens Schkuhr Handb. iii. 541 (1803) sec. Aschers. u. Graebn. Syn. Mitteleur. Flor. V. i. 117 (1913).

Tabriz, garden weed, 9.27, No. 2165 ; east of Tabriz, 29.10.27, No. 2185 ; cultivated at Kew from Tabriz seed, 13.10.28.

Distrib. Cent. Eur., Crimea, Russia, Asia Minor, Syria, Palestine, Iraq, Caucasus, Transcaucasus, Persia, Cent. Asia.

A. tatarica L. Sp. Pl. 1053 (1753), var. **incisa** Gürke in Richter-Gürke Pl. Eur. ii. 146 (1897).

Near Tabriz, garden weed, 2.9.27, No. 2164.

Distrib. (of species) E.N. Temp. Region.

(of var.) here and there in the species area.

Blitum virgatum L. Sp. Pl. 4 (1753).

Yam, 6.28, No. 2383.

Distrib. E.N. Temp. Region.

Ceratocarpus arenarius L. Sp. Pl. (1753).

Hills south of Tabriz, one of the commonest plants, flowers in early June and fruits in late autumn, No. 2186.

Distrib. Spain, E. Balkan Penins., Cent. and S. Russia, Armenia, Crimea, Transcaucasus, Persia, Turkestan, Afghanistan, Cent. Asia.

Chenopodium album L. Sp. Pl. 219 (1753) s.l.

Tabriz, 11.25, No. 1313.

Distrib. Now cosmopolitan.

A variety (?) with very slender inflorescences.

C. Botrys L. Sp. Pl. 219 (1753).

Hills to the south of Tabriz, 6.28, No. 2378.

Distrib. N. Temp. Region.

C. opulifolium Schrad. in DC. Flor. Fr. vi. 372 (1815).

Near Tabriz, weed in garden, 7.27, No. 2163.

Distrib. Medit. Region.

C. Vulvaria L. Sp. Pl. 220 (1753).

Near Tabriz, weed in garden, 7.27, No. 2162.

Distrib. Eur. and Medit. Region.

Halanthium rariflorum C. Koch in Linnaea xvii. 314 (1843), var. **sanguineum Turvill** var. nov.; ab exemplaribus in Herb. Kew. planta glabra, foliis brevioribus, appendicibus sanguineis vel sucineobrunneis differt.

Near Tabriz, in fruit, 11.25, No. 1312a; north-east of Tabriz, among the ruins of an old fort called the Rashdiyeh Fort, in fruit, 10.27, No. 2176 (nomenclatural type of var.).

Distrib. (of species) Armenia, N. Persia.

XLIX.—MISCELLANEOUS NOTES.

His Majesty the King, on the recommendation of the Secretary of State for Scotland, has approved the appointment of Dr. JOHN WALTON, M.A., D.Sc., Lecturer in Botany in the University of Manchester, to be Regius Professor of Botany in the University of Glasgow.

Phenological observations in Britain.*—The Phenological work of the Royal Meteorological Society has been carried on for a long period and the number of observers is now nearly 500. On the botanical side the first date of flowering of fourteen plants has been the subject of most of the co-operative observation. The selected plants are hazel, coltsfoot, wood anemone, blackthorn, garlic hedge-mustard, horse-chestnut, hawthorn, white ox-eye, dog rose, black knapweed, harebell, greater bindweed, devil's bit scabious, and ivy. The results are given in tables, maps showing floral isophenes, or lines of equal flowering dates, and floral isakairs, or lines of equal divergence from the average flowering date. The isophenes and isakairs are obtained from mean values of the actual dates obtained by observation of all (or some) of the plants in the above list. In addition special records and notes are published.

For the season December 1928 to November 1929 inclusive, the ease with which extreme conditions may become masked by combination is well illustrated. Plants are said to afford the most reliable test, and the results are best expressed in the isakair chart based on the eight effective months, December to July. There we find a band of earliness covering much of N. and E. Ireland, and S.W. and E. Scotland. England and Wales are only credited with three or four small patches barely on the early side, from which lateness grows greater and greater towards the E. and S.E., until it exceeds a fortnight late.

The inclusion of black knapweed in the list of plants is open to considerable criticism. Recent research has shown that *Centaurea*

*Report on the Phenological Observations in the British Isles from December, 1928, to November, 1929. Quart. Journ. R. Meteorological Society liv. No. 235 (1930), pp. 207–270, 14 tables, 6 figures (maps and chart in black and white), price 3s.

nigra, in the broad sense, is an extremely polymorphic species, that not only are there many varieties, but that, especially in the south of England, hybrid populations between it and *C. jacea* are not uncommon. Moreover, at the Potterne Research Station and at Kew, earlier and later flowering races have been obtained from wild material, precocity of flowering being, for some races at least, a definitely inherent character. It is stated that the black knapweed has given less satisfactory results than the other species and the reason suggested is that observers have confused it with *C. scabiosa*. If this is so there is little chance that *C. jacea*, *C. nemoralis*, and hybrid populations have been distinguished and the value of the massed records of nearly 500 observers can only be small. It is suggested that either a more suitable species be found to take the place of the black knapweed or that all observers submit complete specimens to Kew so that the observations can be separated into groups based on taxonomically equivalent plants. W. B. T.

Spore Ornamentation of the Russulas.*—This is an interesting contribution to the study of the difficult genus *Russula*, and worthy of careful attention by all students of Agarics. The author claims that with proper use of the microscope, as to which a full introductory account is given, it is possible to distinguish the species and varieties of *Russula* by the characters of the surface-markings of their spores. Macroscopic characters and staining reactions are not neglected, but the spore-markings are said to be remarkably constant, and to afford valuable corroborative evidence, or even to be the decisive character, in doubtful cases. To obtain the correct image it is however necessary to use an immersion lens (the author used an apochromatic objective of N.A.1.2. in conjunction with a compensating ocular of x 25) and an aplanatic-achromatic condenser (N.A. 1.3), with illumination exactly adjusted as to size and distance.

Spore-markings are therefore not characters which are easily available to the field mycologist, but if their careful study will assist in the elucidation of some of the puzzling problems in this genus, Mr. Crawshay will have done a great service. As an instance of possible results, the author has come to the conclusion that *Russula furcata* (Pers.) Fr. is only an abnormal form of *R. cyanoxantha*, and that *R. fragilis* is a variety of *R. emetica*.

In the body of the work 92 species and varieties of *Russula* are described, arranged according to a dichotomous key. Following this are special notes on difficult or doubtful species, and a list of species classified according to the colour of the spore-deposit.

A preface to the book has been written by the distinguished French mycologist, M. Frederic Bataille.

E. M. W.

*Spore Ornamentation of the Russulas, by Richard Crawshay. Baillière, Tindall and Cox, London, 1930. pp. 188, 20 figures in text, 3 coloured plates, and 46 uncoloured plates of spore-drawings. Price 12s. 6d. net.

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